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FIRST AERO WEEKLY IN THE WORLD

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

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OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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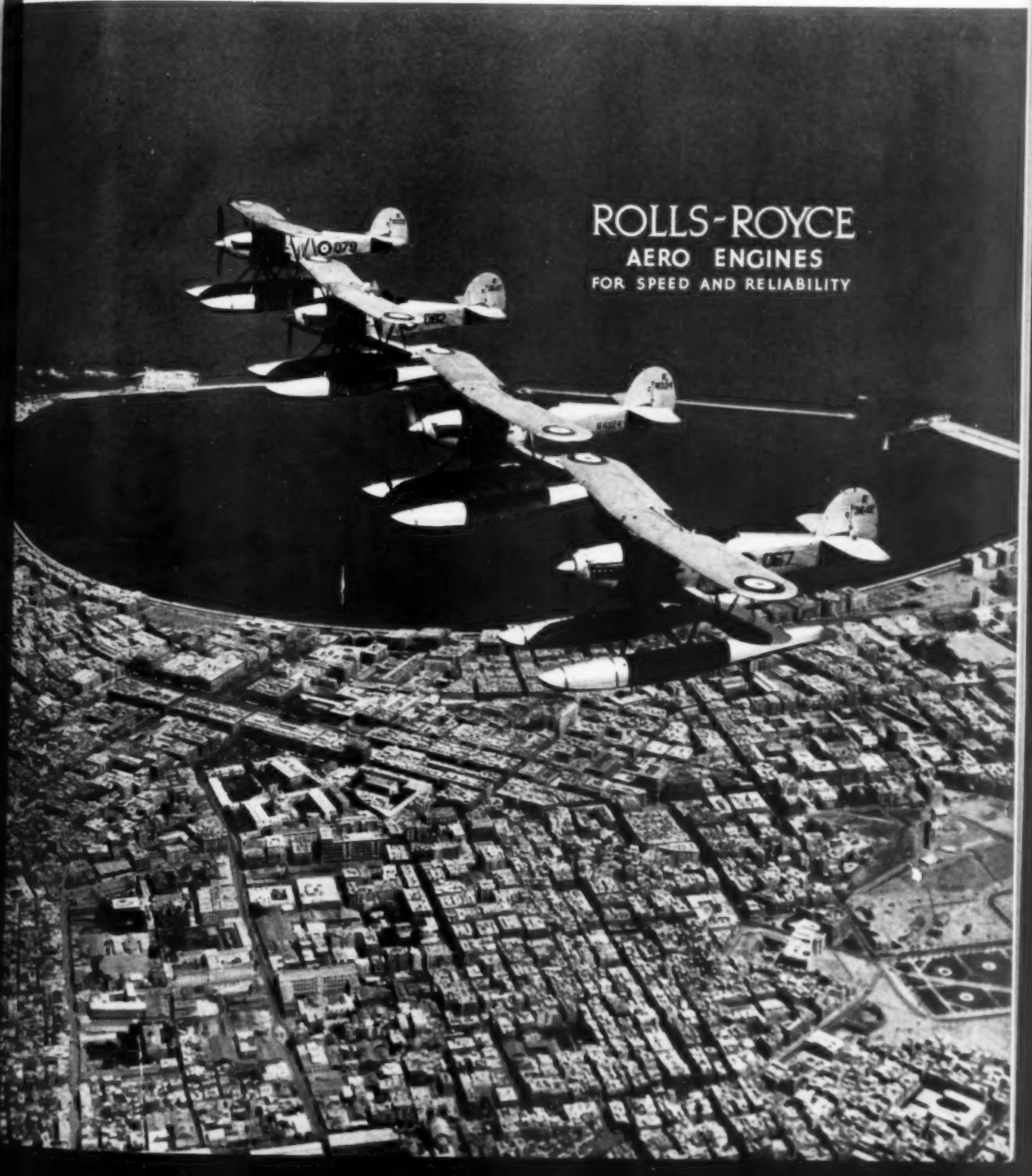
EVERY THURSDAY



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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

Telegrams : Truditur, Sedist, London. Telephone : Waterloo 3333 (50 lines).

HERTFORD ST., COVENTRY.	GUILDHALL BUILDINGS, NAVIGATION ST., BIRMINGHAM, 2.	260, DEANSGATE, MANCHESTER, 3.	26B, RENFIELD ST., GLASGOW C.2.
Telegrams: Autocar, Coventry. Telephone: Coventry 5210.	Telegrams: Autopress, Birmingham. Telephone: Midland 2971.	Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.	Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

SUBSCRIPTION RATES: Home and Canada: Year, £1 13 0. 6 months, 16s. 6d. 3 months, 8s. 6d. Other Countries: Year, £1 15 0. 6 months, 17s. 6d. 3 months, 8s. 9d.

No. 1443. Vol. XXX. AUGUST 20, 1936. Thursdays, Price 6d.

Our Greatest Race

MAJOR OLIVER STEWART is most certainly right when he writes in this issue that there are three possible single, simple objectives for which the rules of the King's Cup race should be drawn up. These are (1) a test of the flying and navigating skill of the pilots, (2) a spectacle for the public, and (3) a test of the flying qualities of the aeroplanes. With that no one can reasonably disagree. The trouble in recent years has been that the Racing Committee of the Royal Aero Club has confused issues by trying to aim at more than one of these objectives at the same time. At least the committee has tried to combine the second with one of the other two, and has accordingly pleased nobody. It is therefore desirable to consider the second objective and get our ideas clear about it before going on to consider the other two.

The best way to make air racing provide a spectacle for the public is to race the machines round pylons, or round a very short course, so that they may be in sight of the aerodrome crowd practically all the time. That was done at several meetings at Bournemouth, and the spectacle was certainly exciting enough to please the most jaded appetite for thrills. Almost inevitably it ended in tragedy, and no one wants to have a repetition of that.

In the last three years an attempt has been made to provide a spectacle at Hatfield by flying numerous circuits of a short course. The result has been disappointing. As a sheer spectacle it has been feeble, only rescued from absolute boredom by the efforts of excellent broadcasters. Above all, it has by now been made abundantly clear that only the most minute fraction of the people of London will ever trek out to an aerodrome to watch such a sight. Therefore, if London is to continue to be the central point of the King's Cup race, common sense dictates that all idea of providing a spectacle should be abandoned.

There is an alternative before all hopes of drawing a crowd need be given up. The start and finish of the race could be held at some other city. In one year the race was held at Nottingham, and the response of the public was at least encouraging. Manchester would be likely to give still greater popular support, for that city has always taken a leading part in giving encouragement to flying, and displays by the Lancashire Aero Club have drawn very large and enthusiastic crowds to Woodford and Barton. But, whether Manchester or some other city be chosen, it should be laid down as a principle that if a public spectacle is to be an object, or *the* object, of the race, then the race must not be held on a London aerodrome.

Alternatives

If the decision is taken to disregard all thoughts of a gate, then it becomes a much simpler matter to consider the two other possible objects of the race. It may be a race for pilots or it may be a race for manufacturers. Moreover, there is no reason why a race for manufacturers should not also be a good test of piloting skill. These two requirements are not antipathetic. A race for manufacturers would now be the most valuable and interesting form of contest. It would, moreover, attract a lot of attention in the Press, and thousands who would never make the effort to go to an aerodrome would follow the fortunes of the machines with great interest in their favourite papers. The international race to Melbourne two years ago proved that, for many people who could not tell the difference between a Heyford and a Leopard Moth by sight waxed quite heated as they discussed the comparative merits of the Comet and the Douglas.

It is unfortunately true, as Major Stewart says, that manufacturers cannot be expected to design special machines for a race unless there is a big money prize or some equivalent attraction. In saying this we do not mean to accuse British manufacturers of lack of sport

ing spirit. They have many times proved that they are very fine sportsmen, in proof whereof we may refer to the production of the Bamel, the Sea Lion, and other sporting aircraft of the past. But design and production have now become very costly matters, and not a few firms have to consider the interests of shareholders. A large prize, or a promise by the Air Ministry to buy a winning machine at an agreed fair price, would make a great deal of difference. The Air Ministry cannot be indifferent to the production of a new type of aeroplane with novel qualities of speed and range, and so it does not seem unreasonable to expect active help from that quarter. We might also put it that His Majesty's Secretary of State for Air cannot be indifferent to the fortunes of a cup presented annually by His Majesty the King.

To the useful and practical suggestions made by Major Stewart, the following suggestion might be added. Why should not the race for the King's Cup take the form of a non-handicap race from some aerodrome in England to Malta without intermediate landing, followed by a non-stop return? That would put our designers on their mettle to produce machines with both range and speed. The Empire flavour given by the landing in a Colony would make the contest intensely popular. It would be followed with interest all over the Empire, and it would also be a very good advertisement for British machines on the Continent. Quite possibly large numbers of people would collect to see the finish—though that, as has been urged above, should be a minor consideration. It would be a very fine test of piloting and navigation, and the risks, with modern engines, would not be too great

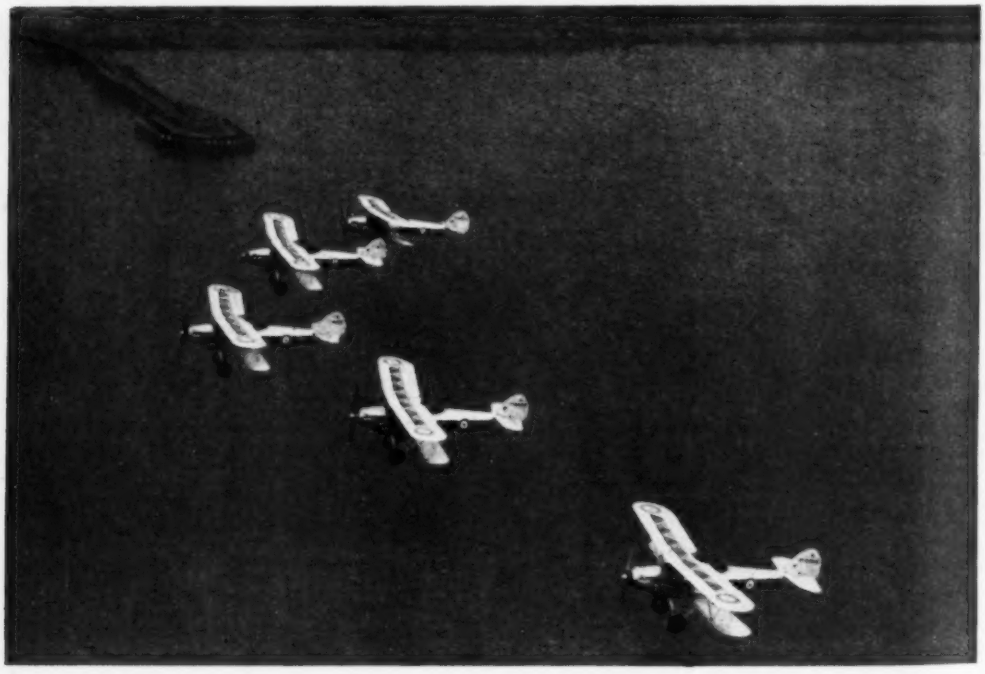
For such a race, adequate warning would have to be given, so that there would be time to design special machines. It is not to be hoped for in 1937, but it might be arranged for 1938 or 1939.

Rescue Craft

THE loss of the flying boat *Cloud of Iona* a few weeks ago, and the finding of the wreckage recently, has drawn attention to the question of rescue craft. The conditions were such at the time that probably no type of craft would have had any chance of finding the ill-fated flying boat quickly, but air services are expanding rapidly, and the time will come when it will be necessary to have some form of rescue craft standing by, ready to rush to the aid of any aircraft which may be forced down. At Cairo, it may be remembered, there was, through a misunderstanding, considerable delay in sending out craft to look for the overdue *City of Khartoum*, and thus that accident is not comparable with the more recent one at home, nor is any useful lesson to be learnt from these wrecks. But it will not be many years before the problem of rescue craft will have to be solved, and it would be better to start work now.

What type of craft is likely to be most suitable is open to discussion. In the Channel there is a fast rescue boat standing by, ready to aid any craft in distress, be it vessel or aircraft. The use of a surface vessel is logical when the position of the craft in distress is known, but for searching when the exact position is unknown an amphibian aircraft would probably be the better type. In America, such "lifeboats of the air" have been used with success.

Experiments might be conducted as a preliminary to making an actual choice, and the question who should pay for such a rescue service would need very careful consideration. Few operating companies could afford the expense, and it would probably be necessary to make the new service a national one.



THE COASTWISE PATROL : The three Auxiliary Air Force Squadrons of the London area have been enjoying a strenuous holiday at the seaside, No. 600 F.S. at Hawkinge, No. 601 at Lympne, and No. 604 at Tangmere. Here five Hawker Demons of 604 (County of Middlesex) (Fighter) Squadron are seen flying past Worthing. (*Flight* photograph.)

The Outlook

A Running Commentary on Air Topics

The Forgotten Diesel

DEUTSCHE LUFT HANSA'S presentation of the Diesel-engined Junkers G.38 at Croydon last Monday has served to draw attention to the fact that, although we in this country seem to have dropped the diesel aero engine like a hot brick (due largely to the introduction of petrol fuel of high octane number), others still regard the compression-ignition engine as being worth while.

With the use to which the D.L.H. are putting the diesel-engined G.38 we are not concerned. Short-haul routes are not, perhaps, the most suitable for showing the diesel to its best advantage, although passenger bookings may be influenced by the absence of fire risk which the diesel is believed to provide. British companies are, however, hard at work on planning long-distance air routes, and in connection with these the diesel should not be forgotten.

Progress in design and construction has been such that it is now possible to begin to think in terms of ranges of more than 2,000 miles against fairly strong headwinds, and it is on such routes, if ever, that the diesel re-enters the picture.

Apart from the low specific fuel consumption, the diesel engine uses a fuel which is a good deal cheaper than petrol. On commercial work this fact may easily become of primary importance, particularly when it is a question of opening a new route. Where routes are already in existence, arrangements have been made for a long period ahead for the supply and storage of petrol, and to change over may prove an expensive business. In the case of a new route, however, such will not be the case, nor is it probable that large stocks of petrol engines are already held.

If the Short-Mayo Composite aircraft comes up to expectations, it would seem to afford one way of overcoming one of the disadvantages of the diesel: relatively low power for the take-off. Catapulting is another possibility. For long-range work such aids are worth while, and, taken in conjunction with diesel aero engines, they offer interesting possibilities.

Air—Hot and . . .

"THE British were first to grasp the fruits of American ingenuity and lost no time in procuring Sikorsky's licence for their design. The result of their mimicking our products is the *Empire* flying boat, which is larger than the Martin Clipper ships and similar to Sikorsky in design. The new British boats lost their Oxford accent, built-in headwinds, and hostelry appearance, and assumed the streamline of American simplicity."

That is how Mr. Frank A. Tichenor expresses himself in a recent issue of *Aero Digest*. Now (as they might say across the herring pond, soon to shrink to ditch-like proportions beneath the wings of the aeroplanes in question) is that nice? Is there any possible justification for the "mimicking" reference? Except for the fact that the Empire boats, like the Martin and Sikorsky, are four-engined monoplanes, there is not the slightest foundation for such a contention.

The two American craft are magnificent pieces of work and *Flight* has been ungrudging in their praise. The Empire boats are of more recent construction. Like the Americans they have four engines because Imperial Airways favour that arrangement, and they are monoplanes because a high performance is desired of them. A cursory inspection by the least experienced of eyes will reveal essential dissimilarities. Perhaps the most striking is the cantilever wing (yes, Mr. Titchenor, fully cantilever and without archaic external members) sprouting directly from the hull (as in Mr. Sikorsky's projected design for that flying boat of fabulous tonnage) and not perched on an auxiliary superstructure as in the Martin and Sikorsky and, of course, our own Blackburn Sydney of seven or eight years back. And the "hostelry" appearance, Mr. Titchenor, is, thank Heaven, still present, *inside* the hull.

Well Missed!

VERY few tactical lessons can be learnt from the fighting in Spain. because it is not a conflict between two well-trained and well-equipped armies. So far as can be judged the bulk of the regular army is in revolt, while the Government forces are largely untrained volunteers.

In the Straits of Gibraltar the duels between aircraft and warships have so far resulted as many naval experts think that such duels will mostly result. That is to say, the bombers have missed the ships, and the ships' guns have missed the bombers. Dive-bombing does not seem to have been attempted. This cannot be due to lack of pluck on the part of the flying corps, for the Spaniards have always been a brave race, but the probability is that the manœuvre has not been practised.

The Bombing of Saragossa

IN Saragossa, the chief town held by the insurgent army, the anti-aircraft guns have been rather surprisingly successful. The *Daily Telegraph's* special correspondent there reports that they have shot down six bombers despatched from Barcelona by the Catalan Government. Some of these are said to have been brought down by machine-gun fire. This is particularly interesting, because it indicates low-flying raids. In the recent air exercises round London several low-flying raids were made, and doubtless our air defence authorities are considering the tactical lessons taught by them. Even if one takes it that the Catalan pilots were mostly civilian volunteers, the result is still striking. To organise raids by wave after wave of bomber squadrons, making use of every wile which long experience and practice have taught, is work which can only be carried through by well-trained regulars; but tactics and practice would seem less essential for low-flying raiders, probably flying alone or in very small formations.

As for the results of the bombing at Saragossa, they are quite in accordance with the teachings of history. So far from intimidating the people of the town, the raiders have proved to be excellent recruiting sergeants. The townsmen have been infuriated and have hurried to enlist. That may be because the damage done by the bombs has been small. It may be that, if a city were subjected to a systematic bombing by a large force of regulars, the people would clamour for surrender. If so, it would be the first time in history that a virile nation had been beaten by "frightfulness." If the two belligerents were of equal strength, the enemy's townsfolk would be clamouring for surrender at the same time. But nothing on that scale has yet happened in Spain.

Mr. Brie initiates the uninitiated with the C.30 Autogiro. A number of people made flights in this machine later in the afternoon. Three of the many visiting machines may be seen below. (*Flight* photograph.)

SUMMER at E

Perfect Weather for the Eastbourne Club's "A H

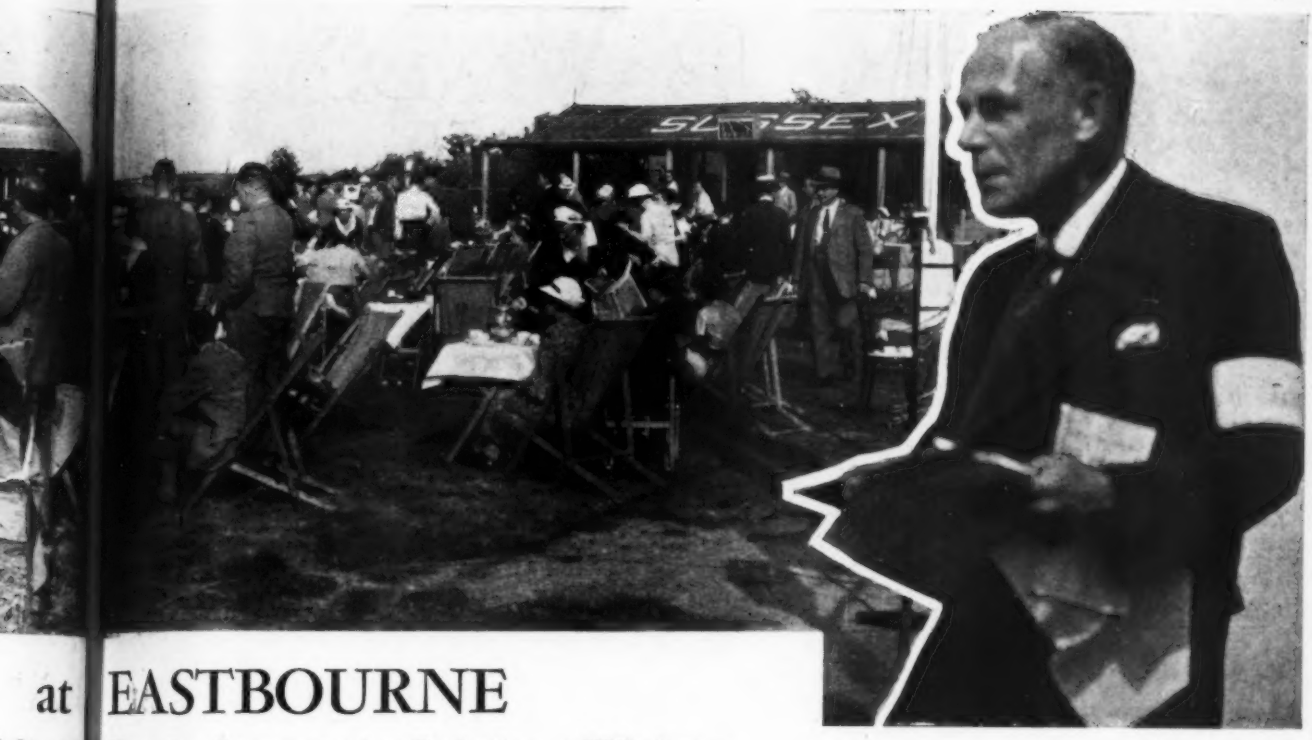
WHEN we had all settled down to the idea that our English summer had played itself out with an exceptional performance on a certain Wednesday in May, it returned unexpectedly (to all, perhaps, but the Met. Office) for the reconstituted Eastbourne Flying Club's first big show last Saturday. Consequently a score or more privately owned machines turned up, quite apart from the considerable number of demonstration, trade and club machines, and those people still swathed in their winter woollies suffered some of the agonies of the damned.

Wilmington Aerodrome, despite the efforts of Capt. Short, the secretary of the club, and of several others, is still its old self—large enough for light aeroplanes, but a little troublesome to pilots of the bigger types. However, everyone got in and out without heart failure, and the Air Dispatch joy-riding Dragon flew with monotonous regularity during the later afternoon, Mr. Falk placing the unspatted wheels on the same blade of grass each time.

For an area which is not abnormally air-minded (to use a somewhat decayed expression) the Eastbourne Club was right to give the visitors a chance of seeing many different machines in the air and in encouraging them to fly. At any aerodrome serving a more air-educated area the demonstration programme might have been considered too long. As it was, the visitors moved to the joy-riding stall in droves, and the club had a considerable job in providing them with tickets (quite apart from flights), so Eastbourne's "At Home" can be taken to have been a huge success as a piece of local propaganda.

The show started with an arrival competition on the usual sealed-time lines. Prince Chirasakti, of Siam, won the event with his new Hornet Moth, and was duly presented with Mr. R. M. Cardwell's cup later in the afternoon.

Thereafter, demonstrations, under the eagle eye of Mr. Jeffs, followed thick and fast. The trouble was to get some of them down. Both the twin-rudder model and the Monospar Ambulance were well shown off respectively by Mr. Nigel Tangye and Mr. H. C. Macphail, the former's slow final approach being particularly effective with a smallish



EASTBOURNE

Home" : Representative Gathering at Wilmington

A general view of the scene at the Eastbourne Club's "At Home" immediately prior to the prize-giving, with some of the club members and guests in the tea enclosure and the Monospar Ambulance on the left. Above is Capt. E. I. Short, the organiser of the event and secretary of the club. (*Flight* photographs.)

aerodrome. Mr. Brie "direct-controlled" in his usual inimitable manner, and later he busily Autogirode the populace. The Heston Phœnix whispered its way around the sky in the hands of Mr. Hordern, and Mr. Kronfeld made his now familiar hands-off knees-on landing, followed (after a climb to stratosphere altitudes) by a dead-stick landing. The public had nearly forgotten all about him when the Drone rustled in over the fence. Even Mr. Ashcroft, the pilot, was not too sure that he would be able to get the cantilever *Pou* off in the allotted space, but in due course, after a nerve-shattering bounce and swerve, the machine became air-borne.

After Mr. Munday had flown the Cirrus-Swallow and repeated the dead-stick performance, Messrs. Tangye, Diamant and Courtenay (the owner of the Swallow and the microphonist) sallied forth to do their most difficult task, that of judging the entries for the Concours d'Elégance. Allowance had to be made, of course, for the number of hours flown by each machine, and this automatically ruled out any but the most incredibly resplendent new machine. In the cabin class the white Monospar Ambulance not unexpectedly took the first prize, with the Heston Phœnix and F/O. C. Allen's Leopard bracketed as runners-up. In the open class Lord Patrick Crichton-Stuart's much-raced Hendy Hobo won the cup, with the Duchess of Bedford's Moth Major second. Unhappily, one of the London Club's Tigers, brought over by Mr. E. M. Wright, was missed by the judges owing to an error in their sheets, and this machine might have stood a good chance with 600 hours of instructional flying to its credit. Mr. Wright had previously put up a safe, excellent and quite extemporaneous aerobatic exhibition to fill a gap in the programme.

Altogether, a worthy piece of work by the organisers of both the "At Home" and the weather. Those pilots returning to London in the smooth air of the evening obtained an almost unparalleled view of Sussex and Surrey, and we, loftily perched in the nose of the London Club's new Dragonfly, saw the whole of London clearly spread out for the third time only in our experience.

Alderman C. J. Knight presents one of the prizes to Prince Chirasakti, who won the arrival competition with his recently acquired Hornet Moth. (*Flight* photograph.)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

In co-operation with the Air Ministry and War Office Gaumont-British are making a film depicting the defence of London.

Eight additional cabins are to be added to the airship *Hindenburg* to make accommodation for sixty-six passengers instead of fifty.

Osoaviakhim, the Soviet Society for Air and Chemical Warfare, controls 150 flying clubs which are to train 8,000 pilots this year.

The society controls, in addition, 240 gliding establishments, which last year trained 20,500 glider pilots.

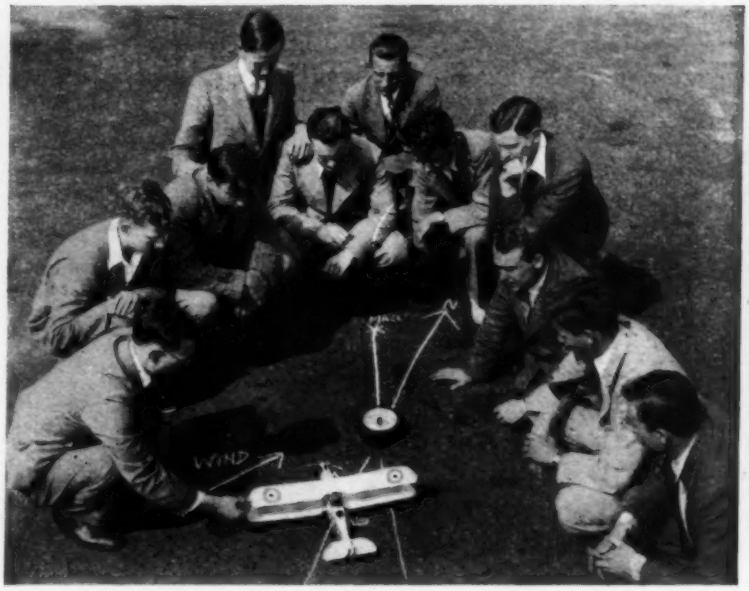
A Bill calling for the spending of £7,350,000 annually on the air force for the next five years has been passed by the French Senate.

Eight Douglas D.C.3 monoplanes of the type illustrated in *Flight* last week have been ordered by K.L.M. for the Holland-Java service.

Hr. Kurt Bjorkvall, accompanied by Baroness Blixen Finnecke, will attempt to fly from New York to Stockholm at the end of this month in a Bellanca Pacemaker.

A scheme is expected to be introduced into the Swiss Parliament shortly which will make "bomb-proof," "gas-proof" cellars compulsory for every house in Switzerland.

H.M.S. *Cumberland* has just completed an extensive refit at Chatham. Her anti-aircraft armament has been much improved and accommodation has been provided for three seaplanes.



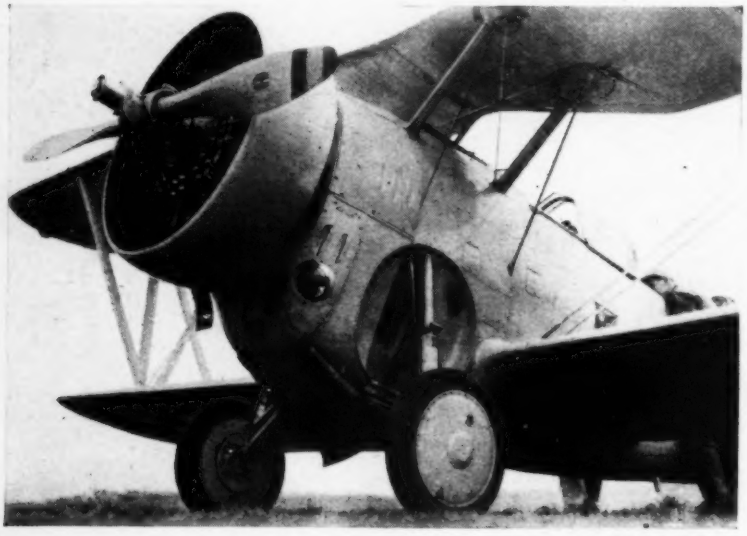
GROUND WORK. Navigation instruction at the third Public Schools Aviation Camp at Norwich.

Dick Merrill, an American, who is shortly to attempt a record round trip between New York and London, has ordered 12,000 ping-pong balls to be packed into the wings and tail of his machine with the hope that should he be forced down at sea, the balls will keep him afloat long enough to be rescued.

Miss Ruth Chatterton, the film star, who is an expert airwoman, has had to sign an agreement with Mr. Samuel Goldwyn, the producer, not to fly her machine until the filming of *Dodsworth* —in which she stars—is completed.

Georges Detre has flown the Gnome-Rhone-engined Potez biplane used by Maryse Hilz to break the French altitude record, to 48,764 ft., thus breaking the world's record of 47,340 reached by the Italian, Donati, in a Caproni biplane with Pegasus engine.

Only 39 aero engines, valued (taking Dutch guilders at 7.50 to the £) at £55,466, were imported into Holland during the six months ended with June last, as compared with 70 at £101,735 in the corresponding half of 1935. Of this year's total Great Britain is credited with 28 engines (£44,000).



CORPULENT WARRIOR. This close-up of the nasal arrangements of a Grumman SF-1 scout of the U.S. Navy shows the retractable undercarriage and the landing light in the fuselage.

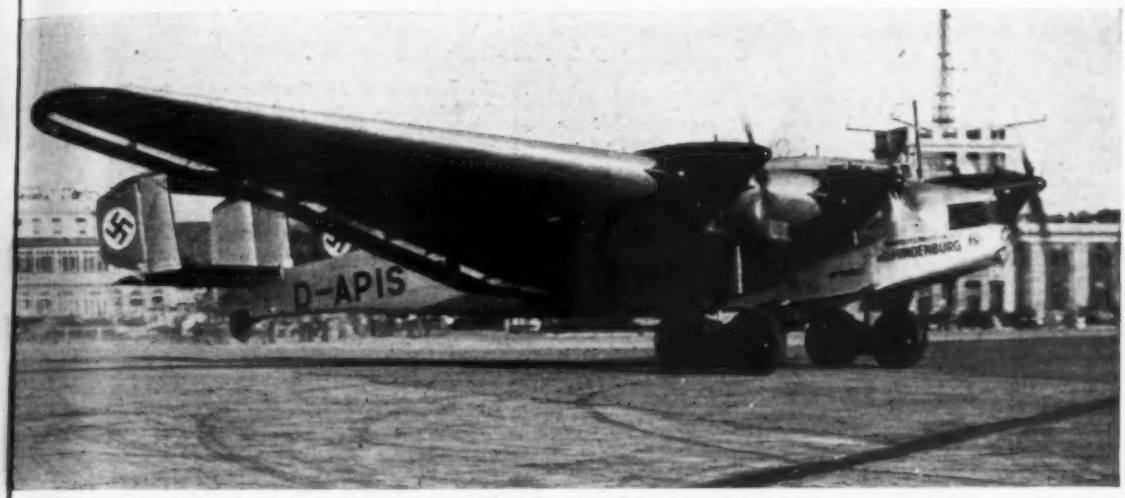
Twenty-five Years Ago

(*From "Flight" of August 19, 1911*).

"While practising on his biplane at Aldershot on Tuesday, Mr. S. F. Cody, by way of demonstrating the importance of aeroplanes in tactics, offered to assist the commander of some Territorial troops who were engaged in a sham fight. The offer was accepted, and about half an hour afterwards Mr. Cody returned from a reconnoitring flight with such detailed information as to enable the officer to conduct a successful attack upon the 'enemy.'"

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



DIESEL GIANT: The Junkers G.38, with four Jumo IV diesel engines, gets her tail up for a tarmac take-off at Croydon. Other *Flight* photographs of this machine appear on page 210.

THE WEEK AT CROYDON

Machines for Spain : Preparing for Civil Life : Indoor Deluge : Arson

QUITE a lot of good business has been done during the past week at Croydon in selling second-hand aeroplanes to one side or the other in the Spanish war. Some people speak of this legitimate business as though it were some sort of crime. Usually such folk have nothing to sell, or else cannot get into the business as agents. Some think that aeroplanes should be sold to one side only, and others say it is all right if you don't sell direct to Spain and pretend to yourself that you don't know where your old aeroplanes are going. Business is business, in my opinion, and if firms can get rid of their old stuff and replace it with up-to-date material, so much the better for airline or air-taxi efficiency.

[It must not be forgotten that, although these civil machines are sold by private enterprise, the impression in Spain and elsewhere will simply be that this country as a whole is supporting one side or the other—with consequent repercussions.—ED.]

The Velox Disaster

The unhappy accident to Imperial Airways' Velox has cast a gloom over the airport, for both Orr and Fergusson were universally popular. The former joined Imperials about eighteen months ago from the R.A.F., and quickly proved himself a civil pilot of just the right calibre. He had done a number of fine flights, chiefly on the Velox. Fergusson had the cheery charm of the Australian. He had considerable experience on American air lines, and had recently become a first-class navigator. On the fatal flight he was there to take sextant readings. Because it was one of a series of experimental flights, there were two wireless operators on board, Dear and Arbuckle. They, like score of others at the airport, were just quiet, efficient, hard-working men who got little or no limelight, yet who were of immense importance in the scheme of things and upon whose shoulders heavy responsibility rested whenever flying conditions were bad. *Requiescat in pace.*

Capt. V. G. Wilson, of Imperial Airways, left last week with a D.H. Rapide for the Iraq Petroleum pipe-line petrol. One hears very little of this highly efficient "silent service" carried on by Imperials. Mr. Woodman, an *ab initio* pupil of Surrey Flying Services, made his first flight one day last week as a first officer with *Scylla* to Brussels.

Mr. Macdonald, of Surreys, informs me that his company has an increasing number of R.A.F. officers who spend their leave taking the necessary civil licences so as to be prepared to take a job when leaving the Service. The day has gone when R.A.F. people came breezily along to civil firms with the idea that what they had learned about one sort of flying in the Service entitled them to act as competent civil pilots straightaway. It is interesting to note, by the way, that Surreys recently had six lady pupils, all of different nationalities, one of them Icelandic (where the depressions come from), though she, I am told, was as cheery as a cricket.

Visitors to our airport often ask why there are, in the ceiling of a corridor in the main building, a series of large bored holes through which water flows in streams when it is wet—and why these holes have been there for at least six months. The answer seems to be that the roof does not keep out the rain and that the ceiling is porous. The official attitude is that it is better to bore holes in the ceiling than to mend the roof, and to hope that the floor below is waterproof. Recently, new holes, capable of directing an icy jet down the neck, have been bored in the ceiling because people have learned to dodge the larger waterspouts.

Bookings on the various air lines are somewhat less intense, but a good summer average is being maintained. K.L.M. broke all outward passenger records for that com-

Commercial Aviation

pany from London last month, and Imperial Airways report a season of unparalleled activity. Air France and Swissair are continually duplicating services.

On Monday afternoon a large pile of deck chairs on the Airport Hotel Terrace were set afire by a smouldering cigarette-end dropped from the flat roof above. Whether some roof-top spectator found air traffic dull or no is not known, but there was not a dull moment after the fire was discovered, which (it being siesta time) was not until it had blazed for five minutes or so and flames had climbed in through the open "pilots' room" window. Then a waiter, tails flying, approached at a gallop, but finding, apparently to his surprise, that the conflagration was hot he retired sucking a blistered thumb. Meanwhile, the air port fire brigade, ever ready to oblige, came roaring acros the tarmac. With the whole aerodrome to play around in the fire tender nevertheless smote a peaceful Air Franc machine on the tarmac hip and thigh, thus precipitatin one perfectly good fireman off his perch, to give a life like imitation of a shot rabbit. In the meantime, th hotel doorkeeper extinguished the fire with what wa either a small fire extinguisher or a syphon of soda. Mon day is not usually so jolly a day at our airport.

A. VIATOR.

Air Navigators

THE following candidates have passed the Second Class Civil Air Navigators' examination which was held in London during the week commencing June 29:

Abraham, R. B.; Anderson, D.; Bernard Smith, G. C. B.; Buchanan, W. G.; Hudson, H. P.; King, D. S.; McGillivray, J. A.; Madge, C. E.; Messiter, D. A.; Mountain, R.; Nelson, A. L.; Pearse, R. C. I.; Renny-Tailyour, Miss S. I. L.; Staples, A. P.; Stone, R. F.; Thomas, O. F. Y.; Valetta, J. A.; Wells, J. H. A.

Forty-five candidates sat. The next examination will be held during the week commencing October 26.

New Zealand Changes

AVIATION DEVELOPMENT, LTD., the promoter company for Great Pacific Airways, which received a licence some twelve months ago for an air service between Auckland and Dunedin, using six-passenger Avros, has decided not to proceed with its plans. The service was dependent on a Government subsidy, which has not been forthcoming.

Consequent on the decision Union Airways of New Zealand, Ltd., have made application to the Minister of Transport, the Hon. R. Semple, for a licence for a service between Wellington and Auckland, with stops at Palmerston North and New Plymouth. Under the present plans the through trip, covering some 350 miles, will occupy three hours.

Machines will leave Wellington and Auckland at noon, so that southbound passengers will have about five hours in Wellington before catching the steamer to Lyttelton, the port for Christchurch, which leaves at 7.45 every evening. By arrangement of the time-tables it will be possible to travel by air from Auckland to Dunedin or vice versa in about seven hours. With present rail and steamer connections it takes two days to make this trip so the business community alone should welcome the service.

Plans are in hand for an extension of East Coast Airways' Gisborne-Napier service to Palmerston North. This will form an important link between the east coast of the North Island and the rapidly growing town of Palmerston North, which is the centre for the Manawatu district.

This extension will also enable passengers to connect with Union Airways flying to Dunedin *via* Blenheim, Christchurch and Timaru. If the extension proposed by Union Airways is carried out (Palmerston North to Auckland), passengers from Gisborne will be able to connect with the Palmerston North-Auckland service, *via* New Plymouth.

The aerodrome licence for Gisborne was recently withdrawn by the Director of Air Services owing to the surface of the ground being too rough and the runways too short for full load take-offs. After a conference between the interested parties, the Public Works Department took the matter in hand and improvements are expected to be sufficiently far advanced by October 1 to enable East Coast Airways to resume their service on that date.

BRITISH ABROAD: One of the Japan Air Transport Company's Airspeed Envoys on the tarmac at Haneda airport, Tokyo. Routes covering some 652,500 miles in the year are now operated regularly by this company—including a service to Manchukuo.

A New Route Map

RAILWAY AIR SERVICES have just published a special map for passengers' use. The map carries annotations descriptive of the main features of each journey and covers all the routes operated by this company. All the aerodromes, both near and far from the routes, the railways and the more important towns are marked.

Stalemate

THE Portsmouth Corporation's request that the Air Ministry should pay 75 per cent. of the capital cost of the new Empire air base has been refused. The Air Ministry has offered £400,000 and will not go beyond this sum.

It is, we must admit, a little difficult to see why the people of Portsmouth should be expected to pay for a scheme which will probably bring glory rather than financial gain. Their attitude is the somewhat natural one—"if Imperial Airways require a special base, then Imperial Airways should build one." This point has already been stressed editorially in *Flight*.

Imperial Airways Traffic

FIGURES going back over the past few years show that during this period the loads carried by Imperial Airways have been increasing so rapidly that they have more than doubled; while during a recent period of twelve months the company's cross-Channel aircraft carried more passengers than all foreign machines together. How traffic has been increasing is shown by statistics comparing the loads carried by Imperial Airways in 1924-25 (their first year) and 1934-35. In 1924-25 the mail-loads comprised about 200,000 letters. By 1934-35 they had increased to over 17,000,000 letters. Passengers for the year 1924-25 amounted to just over 11,000. By 1934-35 they had increased to over 62,000.

Developing Bristol

ON the very sound principle of letting the supply meet the demand Bristol's airport has developed well during the six years of its existence, and there are likely to be more rapid improvements during the coming year when Whitchurch will automatically become the control centre of the projected Western area.

At present, of course, Capt. Winters, the airport manager, acts also as control officer, and is in land-line communication with the radio operator who is installed at the far end of the aerodrome with the Bellini-Tosi D/F station. An Adcock station has now been erected and tested, and this should be in use quite soon—with a corresponding increase in night time or dusk D/F accuracy. There is a distance of 1,500 yards between the boundary at the administrative end of the aerodrome and the new station—only Dundry Hill upsetting the S.S.W.-N.N.E. bad weather approach line to any extent. In due course the administrative building will be rebuilt in the northern corner of the aerodrome.

Meanwhile, the Irish service, operated over the Dublin-Bristol section by Aer Lingus Teoranta, has been running with 100 per cent. regularity despite the Welsh hills and the diverse weather found over the route; there can be little wrong with either the control or the radio operation at Bristol. It is probable that the service will be extended to Croydon in the very near future.

HOLIDAY AIRPORT

The New Weston-Super-Mare Airport in Action : Eight Thousand Passengers by Western Airways in Nine Weeks : Rising Figures

THE fact that air-travel companies can expect the most adequate results on essentially holiday services and, in particular, on shuttle services showing a considerable saving of time over other methods of transport, has been proved once again by the short history of Western Airways' operations from Weston-super-Mare.

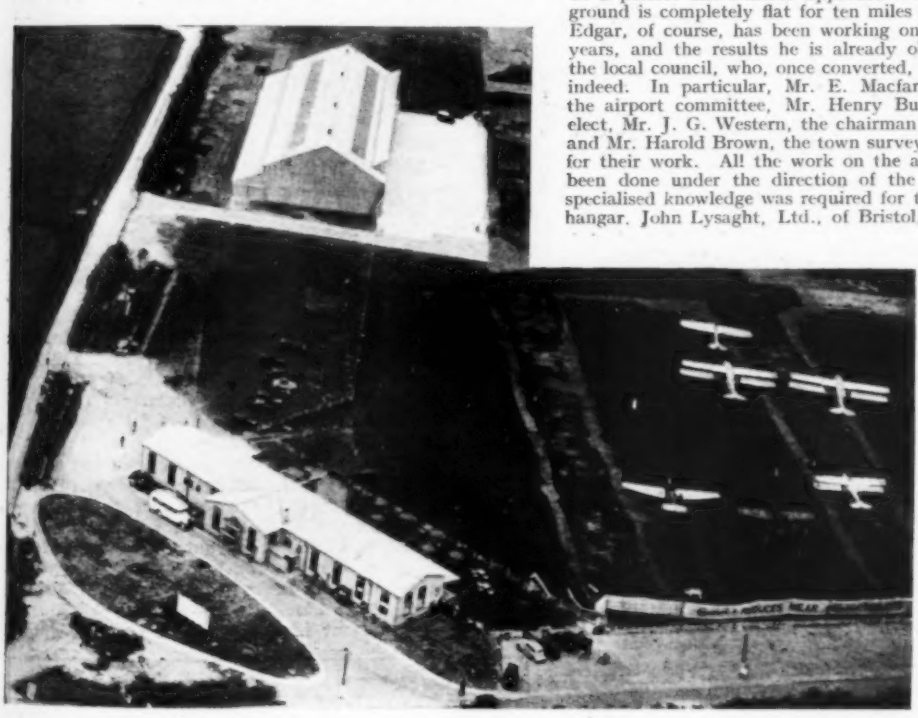
This company is now running an hourly service between Cardiff and Weston in addition to those between Weston, Bristol and Cardiff, and to a new twice-daily service between Birmingham and Weston. Since the beginning of June, Western Airways have made their headquarters at the new airport, though, for the moment, members of the Airwork staff from Bristol are doing the maintenance on the large and heavily worked fleet.

It is an interesting fact that, during the short period at Weston, Mr. Norman Edgar's concern has carried an amazingly greater number of passengers. In fact, during the last fortnight more have been carried than during the whole of last year. Evidently holiday-makers will use the air while business people still view it with misgiving—though it must not be forgotten that a very large number of the new travellers treat the 6s. 6d. passage between Cardiff and Weston as a new and more interesting type of joy-ride. It remains to be seen how the Midlands people will take to the holiday service from Birmingham.

In plain figures, Western Airways carried 2,496 passengers in June, 3,149 in July, and 2,393 in the first *week* of August. This is the kind of service which will eventually demand a type of machine which was originally visualised in the design of the Airspeed Ferry—three of which are now being used by C. W. A. Scott's display for massed joyriding. One manufacturer has already put forward an interesting design for the purpose. More than a year ago *Flight* suggested that there might be a market in this country for a machine in which almost everything had been sacrificed for a large payload with fairly low landing speed. For the moment, with the Weston Airport still unfinished, the D.H. Dragons are sometimes running in triplicate with six passengers each, and electric fuel pumps will shortly be ready to allow high-speed refuelling after each two-way trip. Certainly the organisation of a true shuttle service requires a new technique.

Meanwhile, the public is being really encouraged to see (and to ride in) aeroplanes. The administrative building, which is now nearly complete, has, in addition to the usual booking and general offices, extensive restaurant and similar facilities, with a large verandah, which may be either open or closed and from which the public may watch the machines while taking tea. In addition, there is a public enclosure and plenty of parking space for cars. On request, visitors may be shown round the machines, though, naturally, they are not permitted to wander at will over the aerodrome. The idea behind the whole scheme is the Continental one of encouraging, rather than discouraging, the general public—from whom, after all, the air transport operator obtains his small profits.

Considering that work on the airport was only started in February, the progress has been extraordinarily rapid, and when we landed there last week the usable runways were more than ample. Very shortly the telegraph wires along the main road on the eastern boundary will be taken underground, so that, when work on the landing area is completed, there will be a perfect bad-weather approach from the east, where the ground is completely flat for ten miles or more. Mr. Norman Edgar, of course, has been working on this project for many years, and the results he is already obtaining should satisfy the local council, who, once converted, have been very helpful indeed. In particular, Mr. E. Macfarlane, the chairman of the airport committee, Mr. Henry Butt, the charter-mayor-elect, Mr. J. G. Western, the chairman of the district council, and Mr. Harold Brown, the town surveyor, must be mentioned for their work. All the work on the aerodrome has, in fact, been done under the direction of the latter, though, where specialised knowledge was required for the erection of a roomy hangar, John Lysaght, Ltd., of Bristol, were called in.

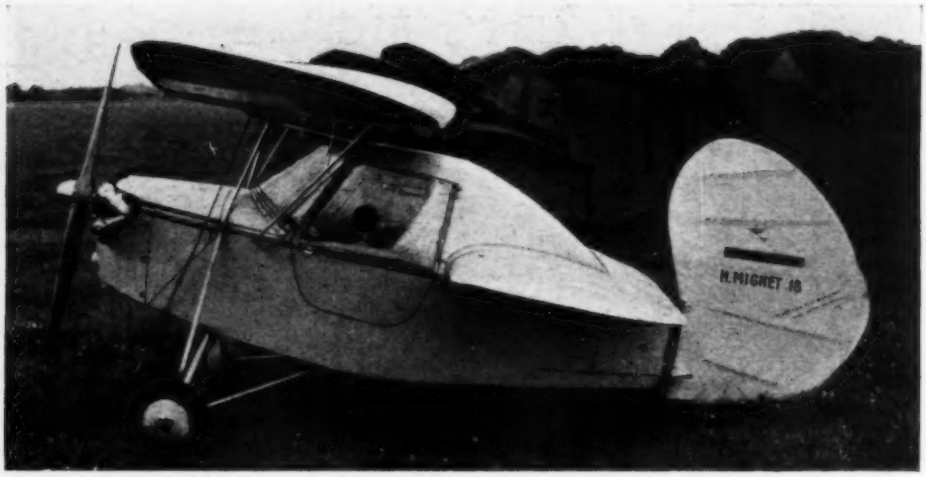


The position of the administrative building in relation to the main road as well as the public enclosure and the car parking areas are clearly shown in this aerial view of a corner of Weston's new airport. Western Airways' hangar can be seen above, with three machines of this company's large fleet on the right.

Radio in the Shetlands

THE long-awaited radio station at Sumburgh, Shetland, is now in action. The frequencies employed for both this and the Kirkwall station are: Air to ground, 333 kc/s (900 m.); and ground to air, 336 kc/s (893 m.). The call-signs are GJF (W/T) and "Sumburgh" (R/T).

Meanwhile, we hear that Stornoway will shortly have the regular air service which had been planned some time ago. A hitch there arose when the Air Ministry refused to license the landing ground at the golf course and recommended the inclusion of an additional 100 acres. As the recommended ground is part of the common pasture of the Steinish crofters it could not be utilised without the authority of the Land Court. The latter have now given the necessary authority, and the crofters will have their rents reduced in compensation.



Mignet's latest. The H.M.18 will probably be the French factory-built version of the *Pou*. Note that the wings do not overlap, and that the front wing is placed much higher than in the original *Pou*. (*Flight* photograph.)

DE-VICEING the POU

Preliminary Results at Chalais-Meudon : Full Control in a Dive : The Stability Question

PRIMARILY intended to discover if the Pou-du-Ciel has any vices, and, if so, whether there are means of curing them, the tests in the full-scale wind tunnel at Chalais-Meudon have now been completed so far as the first part of the problem is concerned. They are, however, being continued with a view to determining the stability characteristics of the machine.

The machine submitted to Chalais-Meudon for tests was one built by the brothers Lambert, at the request of the French Aerial Association, which paid for the experiments. The machine was rigged and trimmed in accordance with what has become known in France as Mignet's "Polygon of Safety." Before submitting the machine for tests at Chalais-Meudon, M. Mignet laid down certain dimensions for the position of the centre of gravity in relation to the front wing, which he, from his very long experience, had found to provide controllability at all speeds. The dimensions, in centimetres, laid down by M. Mignet as representing correct trimming, are shown in the diagram.

It will be observed that the vertical through the centre of gravity passes 70 cm. behind the leading edge of the front wing, that the struts which support the front wing should not be shorter than 75 cm. from the top of the fuselage decking to the bottom of the front wing spar, and that with the machine in cruising attitude the gap between the trailing edge of the front wing and the top of the rear wing should not be less than 40 cm. when the front wing is in the mean position.

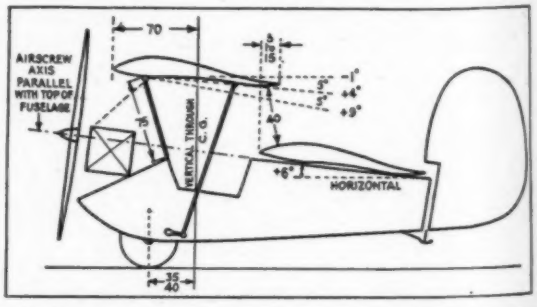
At cruising speed the top of the fuselage, and therefore the rear wing, should have an angle of +6 degrees, and the axis of the airscrew should be parallel with the top of the fuselage, and for preference be in continuation of it. If airscrew clearance permits, M. Mignet prefers that the axis should be *below* the level of position shown in the diagram, but does not regard this as very important.

Many in this country have held that the amount of overlap (the extent to which the trailing edge of the front wing covers the leading edge of the rear wing) is important in connection with the tendency of the machine to go into an uncontrollable dive. M. Mignet does not share that view, and gives a range of overlap from 5 to 15 cm. Another dimension on which M. Mignet gives a certain amount of latitude is the position of the c.g. in relation to the wheel axle, although he stipulates that it should be 35 to 40 cm. behind the axle.

The machine tested at Chalais-Meudon was rigged and trimmed in accordance with this "Polygon of Safety," and was thoroughly flight-tested beforehand by M. Mignet himself and by M. Robert Robineau and the brothers Lambert. The engine was a 25 h.p. Mengin.

During the tests the Pou-du-Ciel was "piloted" in the wind tunnel by, among others, M. Mignet himself. The tests were, of course, carried out with the engine running, so that the effects of the slipstream were reproduced. It was found that in normal flight and stalled flight the machine was controllable. When, however, a certain small angle of incidence was reached the machine became uncontrollable and steepened its dive until, had it been free to do so, it would have gone over on its back. (It may be remembered that in some of the fatal accidents which have occurred the machine got into a steep dive and ultimately crashed upside-down.) No possible movement of the front wing would bring it out.

In order to try to cure this loss of control, the struts which carry the front wing hinge were lengthened, as it



M. Mignet's "Polygon of Safety." The dimensions (in cm.) are those which, coupled with an increase in the maximum angle of the front wing to +14 degrees, are now held to give full controllability of the Pou under all conditions.

The H.M.18 is a cabin single-seater with Mengin engine. It takes off in a very short run and has an excellent climb. (*Flight* photograph.)

was thought that the gap between the wings might be too small and might possibly cause the diving moment. The results were, however, sensibly the same. Then the machine was so re-rigged that the c.g. position was 64 cm. instead of 70 cm. behind the leading edge of the front wing. Still the critical dive took place.

Changes in c.g. position and gap having been found not to effect a cure, the range of incidence angles through which the front wing could be moved was increased. The lower angle, −1 deg., was retained, but the maximum angle was increased from +9 deg. to +14 deg. It was found that with this range of angles, from −1 deg. to +14 deg., the machine was controllable in any attitude, even upside-down. It now rests with constructors to scheme out ways of increasing the maximum angle of the front wing while still retaining the ability to decrease the smallest angle to −1 deg.

Unofficially, Chalais-Meudon also tried a shorter *cabane* to see if a reduction in gap would nullify the cure previously effected by increasing the maximum angle to +14 deg. The machine was rather more "tricky," but control was still retained with the 14 deg. angle.

The French *Section Technique* insists upon certain minimum stability characteristics for all military and transport aircraft. Chalais-Meudon carried out the usual tests on the Pou also, and found that at large angles, i.e., in stalled flight, the stability of the Pou was perfect. At cruising speed the stability was less, but still sufficient by the standards applied to orthodox aircraft. At small angles, corresponding to high speed, the machine was unstable and required constant correction by the pilot. Many will argue that this is totally unimportant, as the Pou-du-Ciel is fundamentally different from the normal aeroplane, and that to expect from it the sort of stability with controls locked which is demanded of normal aeroplanes is rather ridiculous. The Pou is rather by way of being a bicycle of the air and therefore kept in equilibrium by the rider, quite instinctively and without effort. The way several Poux were flown in a strong gusty wind at Ramsgate the other day without trouble rather seems to bear out this contention.

In this connection the Editor of our French contemporary, *Les Ailes*, M. Georges Houard, remarks very sensibly that of the two, the Pou which is "officially unstable" and the orthodox aeroplane which is stable fore and aft, but goes into a spin if left to itself, the Pou, with its total absence of spinning tendencies, is certainly to be preferred.

The Chalais-Meudon tests are being continued, partly to see if the Pou *can* be made to conform with the official French stability criteria, and partly to test the effects of different overlaps. About this latter point there is still some uncertainty, and opinions are divided. M. Mignet himself, as already mentioned, does not think the amount of overlap plays an important part in the flying characteristics, but others believe that the results of the slot effect with large overlap may be considerable. A British Pou has just been installed for tests at Farnborough.

A "TUFTED" POU

Some Interesting Results : Front Wing Stalls

By W. E. GRAY

AT a time when wind-tunnel tests are being carried out on full-sized Poux in France and at the R.A.E., it was thought that it would be of general interest if the airflow over this type of machine were studied in free flight, especially at the stall. The writer therefore asked Mr. Baynes if he could arrange for the Cantilever Pou to be flown for the purpose of securing photographs; this was promptly done, and Mr. Appleby flew the machine a few days ago while photos and some brief film shots were taken; two of the photographs are shown in Figs. 1 and 2.

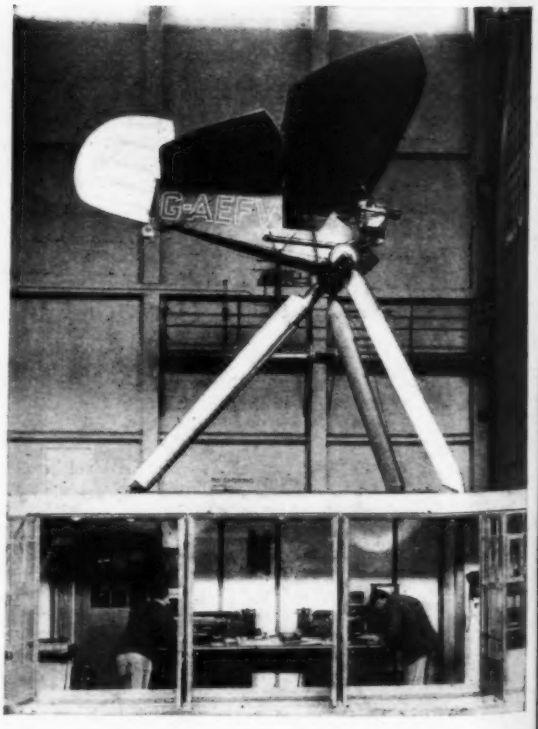
It should be mentioned here that the Cantilever Pou differs considerably from M. Mignet's design as described in his book. One gathers from Mr. Baynes that before building the cantilever machine he went into the stability problem carefully, and came to the conclusion that it was essential for safety to have the C.G. at about 0.4 of the front wing chord instead of at about 0.5, as in M. Mignet's design, and that the rear wing should not carry more than 10 per cent. of the total weight; this makes an interesting comparison with the writer's free spinning tests on a model Pou described in *Flight* in April, 1935, when the more forward positions of the C.G. were found to be much better than the rear ones. Mr. Baynes also decided to give his Cantilever Pou a different wing section and a bigger gap.

It should be mentioned, further, that it is understood that M. Mignet holds the view that the rear wing so influences the flow over the front wing as to increase its lift, and in fact even to prevent it stalling; it seemed very doubtful if this latter could be the case, and it was largely for this reason that the test was made.

In Fig. 1, on the left, the tufts show that most of the port half of the front wing was stalled, due probably to a certain amount of sideslip. The bending inward of the flow at the trailing edge near the tips is seen in Fig. 2, above. The lower photograph shows a Pou on test in the large wind tunnel at Farnborough.

It can be clearly seen from Fig. 1 that most of the port half of the wing has stalled, while the starboard half has not yet gone; this is apparently due to the fact that the machine was flying with about three degrees of sideslip (port wing back). The bending inward of the flow at the T.E. near the tip is of interest in connection with the recent photographs in *Flight* on this subject, but it is not suggested here that all that bending is due to the plan form of the wing; it is clear from Fig. 2 and from other photos taken just before the stall, and from visual observation that the bending was more marked and extended forward over a greater portion of the chord than one would expect from the plan form alone, and it is highly probable, in the writer's opinion, that the suction of the rear wing *was* influencing the flow as claimed by M. Mignet. On the other hand, it is quite clear that the front wing does—on this machine at least—stall quite thoroughly with the stick well back; the gap, of course, is greater than in M. Mignet's design, and in the absence of a test on that type there is room for doubt as to whether its stalling qualities are similar to the Cantilever. It can be seen from Fig. 2 and some of the other photos taken, that the front wing began to stall at the T.E. a little before the remainder of the wing, but the stall could not be said to spread gradually forward—the breakdown appears to be quite rapid. The flow over the rear wing is somewhat divergent—apparently due to the flow from under the front wing.

The tests were not so prolonged as one would have liked, but the machine from which the photographs were being taken was not very suitable for the work and it was not desired to do more than was really necessary and so prolong Mr. Appleby's suspense, as he had no upward view.



PUTTING on the PRESSURE

Some Suggestions for Rejuvenating the King's Cup Air Race

By MAJOR OLIVER STEWART, M.C., A.F.C.

PRESSURE is the thing the King's Cup Air Race lacks. It may be, and sometimes is, full of sound and fury; but it signifies nothing. There is none of the psychological pressure which results from the clash of powerful forces, the feeling that big technical issues are at stake. Although there was no "close finish" in either of the last two Schneider Trophy races, although in one the race consisted in a simple flight round the course by a single seaplane, there was immense pressure, the pressure generated by months and years of frantically stoked-up technical effort.

It is my belief that a certain amount of pressure might be generated for the King's Cup Air Race if the existing methods of running it were abandoned and an altogether

Sired by a racer: The new Howard four-seater (Whirlwind 320) developed from the indefatigable *Mr. Mulligan*.

new plan, about which I shall make proposals, was adopted. The approach of the South Africa race makes it more than ever important that there should be some clear thinking about air racing in general at the present moment.

For some years three chief assumptions appear to have ruled the planning of the King's Cup Air Race: First, that a close finish is desirable; secondly, that everybody should be pleased; and thirdly, that in no circumstances whatever should the best man be allowed to win!

If one entered a superlatively good 400-miles-an-hour aeroplane it would be the duty of Mr. Rowarth and Mr. Dancy to use all the means in their power to prevent it from crossing the finishing line ahead of any superlatively bad 200-miles-an-hour aeroplane which might happen to be competing. In such circumstances any effort expended in the design and construction of an aeroplane is wasted. There is no clash of anything other than the numerals in the handicappers' note-books, and the only thing that might produce a spontaneous outburst of cheering from the spectators would be a particularly neat piece of slide-rule work. A "close finish" in the Olympic sense, when two competitors are using all they have in a last desperate struggle for victory, is no more possible in the 1936 type of King's Cup Race than it is between the 3.30 and the 4.30 trains to Brighton.

As for the attempt to please everybody, it has resulted in turning the race into a sort of junk heap; a collection of articles, most of them with parts missing. It includes a little pylon racing, a little navigational work, a little speed, a little class racing, a little handicapping, a little scratch racing, a little refuelling. In fact, almost the only thing it does *not* include is a parade of beach pyjamas. As usual, the attempt to please everybody has resulted in pleasing nobody—other than the officials.

Let a starting point be selected for examining means of rejuvenating the race. When I put my views on the race before the Royal Aero Club Racing Committee some years ago I prefaced them with the remark that, if there is to be pressure, a single, simple objective for the race must be laid down before an attempt is made to plan details. There are three possible single, simple objectives which fit the conditions under which the Cup is given. The race may be:—

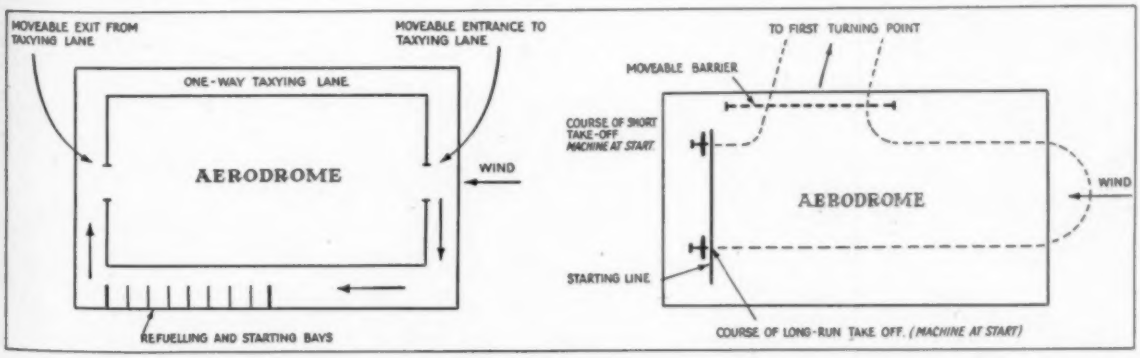
(1) A test of the flying and navigating skill of the pilots.
(2) A spectacle for the public.
(3) A test of the qualities of the aeroplanes.

If one of these objectives is selected and firmly steered for a great many people will be very annoyed; *but* pressure will be created, and the outcome will be a first-class race.

Let me set out briefly, as a basis for discussion, the type of race I should plan for each of these three objectives.

Objective I

If it is decided that the race shall test the flying and navigating skill of the pilots the type of cross-country race with which I was associated at Heston Airport some four years ago would, in slightly modified form, be suitable. Details of the two races of this type that were held were given in *Flight* at the time. Here all I need do is to



The left-hand diagram shows Major Stewart's suggested aerodrome layout for a race designed to offer a spectacle for the public and that on the right to test the qualities of the aircraft.

Reading down and round from the left these American racing types, familiar to visitors to the American National Air Races are: Gordon Israels; Wittman; Heath; Gilmore; Howard; Keith Rider; Miles and Attwood; Nicholas Beazley.

recall some of the chief features of the race.

It is the only kind of race in which handicapping on estimated performance is admissible. The pilots had to fly solo, and the course was kept secret until the start. Competitors were lined up some distance behind their aeroplanes. In front of each one was a small table with a rolled-up map on it. On the fall of the flag the competitor seized his map and, on opening it, saw for the first time where he had to fly. It was then for him to work out his course and get round as quickly as possible.

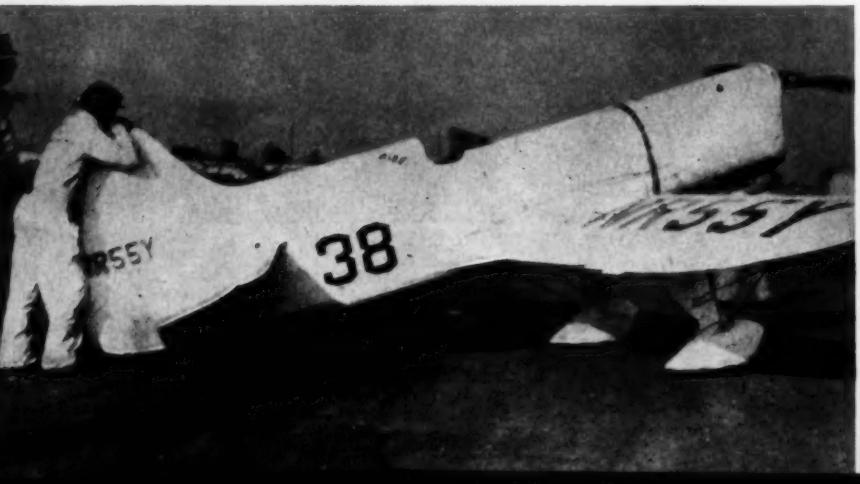
Nobody who saw those two races could doubt that they were more severe tests of piloting and navigating skill than anything in the King's Cup Air Race. I think they were rather more dangerous than the King's Cup Race, and, in fact, in one race a fatal accident occurred. But air racing, like motor car racing, cannot entirely avoid danger. There can be no doubt that the pilot who won both the cross-country air races took risks, but he also gave proof of a very high degree of flying and navigating ability.

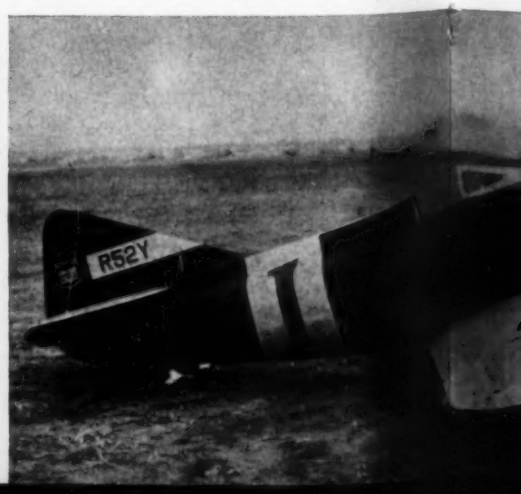
Objective II

If it is decided that a spectacle for the public should be staged all the mechanism of spectacle must be set in motion. There must be, at the start, the crash of a maroon; there must be, at the finish, a similar aural signal as the winner crosses the line, and there must also be a visual indication of who the winner is; reliance on loud speakers has proved to be misplaced. But what of the planning of the race itself? I have a long-cherished scheme for such a race, and I hope that one day the opportunity will come for me to put it into practice.

Each aeroplane has a roped-off refuelling "bay," in which it stands at the start. It has its petrol tanks empty and—no matter whether it is fitted with wheel brakes or not—there are chocks before the wheels. Two people are allowed in each refuelling bay, and only two, the pilot and a mechanic or second pilot. In each bay the fuel for the machine is contained in standard two-gallon petrol cans. Tools and other equipment are permitted, but no kind of petrol pump.

Each aeroplane must be flown solo. Along





the front of the refuelling bays is a taxying lane, running from the windward side of the aerodrome to the leeward side round the edge. It is a one-way lane, and while they are in it the aeroplanes must have a man running at the wing tip—the mechanic or second pilot—to prevent furious taxying. No overtaking is permitted in the taxying lane. The course may be, perhaps, 1,200 miles, with a circuit of, say, 50 miles, though on these points no decision could be made without experiment.

Imagine the start of such a race. On the fall of the flag and the sound of the maroon there would be the preliminary race to fill up with the two-gallon cans. The machines with the longer range would suffer. Power would make its own practical handicap without calling upon Mr. Dancy and Mr. Rowarth. There would be the spectacle of people doing things in a hurry. There would be *pressure*. Most of the machines would have to refuel at least once. There would be more spectacle, more pressure. And if, after all, the fastest aeroplane won, would it really be quite such a tragic misfortune as the Royal Aero Club seems to think?

Objective III

For testing the qualities of the aeroplanes a very different kind of race is demanded. In the first place, more than one year's notice of the conditions is essential so that manufacturers who care to do so can build aeroplanes. I believe that there is scope for a King's Cup Air Race in 1938 designed to test the qualities of the aeroplanes. But bigger money prizes must be offered if manufacturers are to be induced to build special machines, and even then the race would have to receive the blessing of the British manufacturer's chief customer, the Air Ministry, if it were to be properly supported.

Fortunately, it so happens that the bigger money prizes can be reconciled with the Air Ministry's blessing. Lord Wakefield has been extraordinarily generous in his support of the race, and it would be base ingratitude to ask him for more money. But prove to the Air Ministry that useful full-scale research and technical development are to be stimulated by the race; that it will be an instrument for maintaining that swift technical advance of which Sir Philip Sassoon has often spoken, and Government support would certainly be forthcoming. After all, the Martlesham competitions of—I think—1922, which took place when I was still stationed there, was supported by the Government. How could the race be planned so as to act as a powerful stimulus to technical development? Here is my basis for discussion.

Clearly the chief quality in an aeroplane is speed. Whether the machine is military or civil it must be *fast*. After speed come two opposing qualities: short landing and short take-off. Of two aeroplanes with equal top speeds, the one that can take off and land in the shorter space will be the better. But always the master quality is top speed. Consequently, I would propose a pure speed race, without any time handicap. ***But I would give the short take-off, short landing machine a slight advantage by means of a special landing and take-off plan.***

The aeroplanes are lined up for the start along the leeward boundary of the aerodrome. Along about half of the left-hand boundary, as viewed by the pilots, there is a barrier 20ft. or 30ft. high (which might be of the balloon type used at Martlesham). At the start the aeroplanes must take off (either in pairs or at fixed intervals), ***turn left, and pass over this barrier*** before going to the first turning point. At the end of each lap, which would represent a fairly large part of the course, the aeroplanes would be required to ***approach over the barrier***, turn left, land, and run to a standstill. Their times would be taken from the start to the standstill, and an interval would be allowed for the taxying back to the starting line.

Observe the effect of this. Without introducing any artificial form of handicapping, it gives a slight advantage to the aeroplane which is capable of short take-off and short landing. That machine has less distance to fly. The jumping giro, to take an extreme case, could start close up to the barrier and be away on its course while the normal fixed-wing machine with very heavy loading would still be careering across the aerodrome getting up speed. Similarly, the jumping giro would save useful seconds by its spot landing over the barrier. It is to be emphasised that the advantage given by this take-off and landing would not, and is not intended to, enable slow machines to win. It is intended merely to ensure that the fast machines have reasonable landing and take-off qualities.

The objection that a procedure requiring special manœuvres at the take-off and the landing would be too dangerous applies if a large entry were expected. But for this kind of race a large entry would not be expected. Half a dozen machines or a dozen would be enough to make it well worth while if special types were designed and built. It is to be noted, too, that by this form of physical handicapping the designer is permitted to use his ingenuity with some chance of reward. There lies the technical pressure. Catapulting (provided the apparatus did not clutter up the aerodrome) and arresting would obviously be permitted, and they might give notable advantages.

Half a ton or so: This photograph gives an idea of the method used for stowing freight in one of the G.A. Junkers—it is actually being loaded at Lae for transport to the Bulolo goldfields. The size of the loading hatch is noteworthy.

TONS BY AIR

The Amazing Work Done by Air Transport in New Guinea: Some of the Problems Involved: Why Certain Types are Preferred

By BRUCE FOSTER, B.C.E., D.I.C.

DURING 1935, eighteen million pounds of freight was carried by air in New Guinea. In figures it looks like this:—

18,000,000 lb.

Or if it is tons which conveys the magnitude better, eight thousand is the figure, and thirty-six aeroplanes did the job, so they must have averaged some 220 tons apiece. Two hundred and twenty tons of cars, cows, hydraulic dredges, pipelines, and—gold. That is what all the fuss is about.

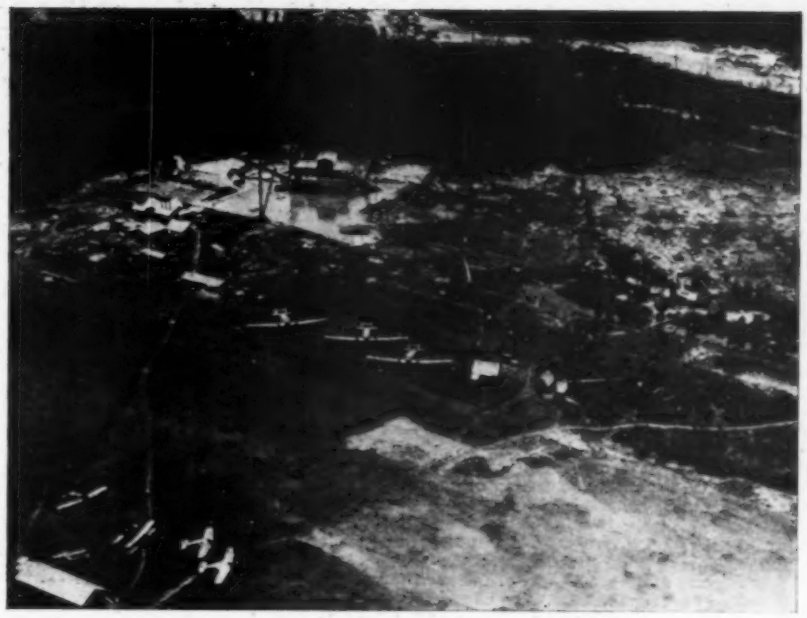
All this activity in aerial transport is merely to obtain gold from the ground. Gold, which, refined, will, except for the little in our teeth and fountain-pen nibs, be secure and untouched in the vaults of the banks, whence it will no doubt cause to be emanated that magic aura which allows us to handle our few pound notes without losing confidence therein.

There are several air transport companies operating in the gold country of north-east New Guinea, and of these Guinea Airways is probably the best known. Their headquarters are at Lae, and they operate to all the well-known places, such as Wau, Buolo, Salamana, and to all the lesser-known places as well. The company transports just *anything* by air so long as it can be got into an aeroplane. A person in the interior has a new motor car sent from Sydney by ship to Lae; it is then loaded, complete, into an aeroplane for transport over the 10,000 ft. mountains. Most cars will just go down through the Junkers' hatch when laid on their side, but the Ford is just too big, and it is necessary to separate the chassis and body for loading.

Lae aerodrome, being on the coast, is at sea-level, but Mt. Hazen is at 6,500 ft., and is the highest aerodrome used. The condition of aerodromes and landing grounds varies from very good to very bad. Many of them are on steep grades —1 in 4 is the worst!—and frequently only consist of a narrow strip of ground on which the grass may have been cut down —or it may not. Ramu, at an altitude of 4,000 ft., has a runway only 50 yards wide and 370 yards long (a Junkers carrying one ton can be landed on this, but 400 lb. is the maximum load for take-off). The pilots must land on strips such as these with heavily loaded machines in, perhaps, a cross-wind of 25 m.p.h., and on most aerodromes the difficulties of landing are increased by the fact that Nature only allows one try. On some of the aerodromes the pilots have to disregard wind direction entirely and always land uphill, even though this may be downwind.

Guinea Airways has a staff of eleven pilots. The total white staff is ninety, and 250 natives are employed. The pilots average about 900 hours per year each, and they are all 5,000-hour men. Flying is very seriously interfered with by rain in the wet season from July to November. Wet aerodromes make landings dangerous, and excessive cloud in the mountains forces pilots back; for Guinea Airways discourages blind-flying by its pilots. There are very good reasons for this, for to vanquish the high mountains with a heavily loaded machine it is sometimes necessary to use the passes, and one does not navigate mountain passes with blind-flying instruments, particularly passes which are so narrow that one cannot turn back after entering them. The alternative of going right over the clouds may be impossible as they may extend up to 19,000 ft., which is higher than the ceiling of most of the fully loaded machines. The

Bovine airmindedness: Unloading a bull and a cow from one of the G.31s at Wau aerodrome. The advantages of low-wing all-metal construction are made quite obvious.



The gold rush: One of the mine landing grounds with the dredge in operation and most of the Guinea Airways' fleet deployed on the field.

changes of altitude are very great in one short run of only forty miles. In this distance one takes off at sea-level, clears 10,500 ft. and then descends to land at an aerodrome 2,000 ft. above sea-level.

For these arduous conditions of steep climbs, heavy loads, many landings and rough aerodromes, all-metal machines are used, and Guinea Airways will no longer consider buying a wooden aeroplane. The reasons given for this preference are:—

1. Longer life; 2. Lower maintenance costs; 3. No hangars needed; 4. Greater freedom from damage in minor accidents; and 5. The metal wing retains its original aerofoil shape in tropical conditions.

The aircraft, perforce, spend most of their time outside, and their reaction to corrosion is rather interesting. At Lae they are always in the salt-laden sea-breeze, and heavy rain is frequent. Yet no corrosion troubles are experienced. It seems that the heavy rain washes the metal and, going on this theory, the staff imitate Nature and hose the aeroplanes down, inside and out, during any dry weather. This treatment is quite successful.

The machines now in use consist of four Junkers G.31; three Junkers W.34; two tri-motor Fords; two Stinson Reliants; one D.H. Moth; and one Fox Moth. On order there are two Lockheeds (an Electra and a 12A, the smaller and faster version) and one B.F.W.Me.108 for light charter work.

For their particular job, Guinea Airways favour the low-wing design—at least in the bigger sizes—and they have a majority of this type. They can load these machines by crane through the roof and lower the load right down on to the wing spar itself, so carrying it in the most direct way possible. Of course, all heavy freight cannot be carried on the wing spar itself, but in the case of shafts of large weight but small dimensions, it is necessary to carry the load on a very robust part of the structure.

The low-wing design is also favoured because the "ground-effect" in take-off and landing is very marked, they claim, and this is of great importance in a country of small aerodromes.

The record of all the air transport companies operating in New Guinea is certainly a proud one. In face of great natural difficulties they have made good, and transported many passengers and many thousands of tons of goods with almost complete freedom from loss of life and property. For this, the credit belongs to many people—to the pilots, chiefly Australian, who operate the aeroplanes, and to the designers and constructors who produced them.

[The photographs illustrating this article are reproduced by courtesy of the Vacuum Oil Company and Pilot Koch.]

This map shows the area covered by air transport in New Guinea and the position of the more important centres.

Expansion in India

IT was shown some time ago that between 1933 and 1935 the loads of mail carried by the Indian internal air services increased from 10.5 tons to 43.4 tons, and that over one quarter of the letters which go from India to other countries in the British Empire are now sent by air. The number of passengers conveyed to and from India by air has, in the past five years, increased sevenfold.

Figures which are now available show that no less than 43.7 tons of air mail were carried from Karachi to Calcutta last year and 42.5 tons in the opposite direction. The figures represent an increase of 128.5 per cent. on the weight carried in the preceding year. Increases were most marked towards the end of the year, after the inauguration of the bi-weekly service each way and the extension of the Imperial trunk air line from Calcutta to Australia. The passenger-ton mileage has similarly increased Passenger-ton miles in India in 1933 totalled 12,311, while in 1934 the figure was 78,375, and in 1935 it rose to 117,180 This amounts almost to a multiplication by ten in two years.

The comparative statistics for the first half of the current year point to a continued increase in traffic. There can be no doubt whatever that the public are making more use of air transport as its facilities are increased and become more familiar, and that when the new Empire trunk services, with low postal rates, flying eastward and westward across India, come into operation in the near future, the same tendency will become still more noticeable.

HERE and THERE

B.G.A. Changes

THE address of the British Gliding Association, Ltd., is now 119, Piccadilly, London, W.1, and Comdr. H. E. Perrin is Secretary in succession to Mr. F. D. Bradbrooke. The telephone number is Grosvenor 1246-7-8.

The Rhodesian Rally

RATHER more than fifty machines arrived at Salisbury, Southern Rhodesia, for the rally which was held there last week-end. These included an R.A.F. flight from Heliopolis and an S.A.A.F. flight from Pretoria.

Studies at Gravesend

THOSE contemplating a course of aeronautical engineering will find much of interest in the prospectus of the two years' course of the School of Engineering operated by Airworthiness, Ltd., at Gravesend Airport. In addition to the practical work, a series of lectures is given by the school's staff on such subjects as repair and overhaul, bench testing and the scientific properties and testing of materials. In addition, extra theoretical tuition is given after normal working hours by lecturers from the Medway Technical Institute of Rochester, on advanced machine drawing, aerodynamics and aero mechanics. Visits are arranged to the works of a leading manufacturers as a regular part of the curriculum. The minimum age of entry is sixteen.

Messrs. H. C. Brown and G. Heeley have been in charge of the school and workshops at Gravesend almost from the beginning.

Latvia Likes British

THREE Fairey Seal seaplanes fitted with Bristol Pegasus engines, which form part of the equipment of the Latvian Air Force, recently completed an interesting cruise around the Baltic and North Seas, involving a total flight of 6,500 km. The squadron, incidentally, visited England to attend the R.A.F. and S.B.A.C. Displays at the end of June.

A correspondent in Latvia, reporting to the makers of the engines upon the return of the machines to Latvia, writes:—

"It will interest you to hear that the three Fairey Seal aeroplanes with nine Latvian officers who arrived at Southampton and visited Hendon and Hatfield, and made a journey of nearly 6,500 km. around the Baltic and North Seas, arrived quite safely back in Latvia. During the whole trip the Pegasus III engines have been working excellently, and this trip, which really in some cases has been difficult owing to bad weather and wind conditions, has once more proved the high quality of your engines."

Air Police in Action

Eagles Restrained. By Brian Tunstall. (George Allen and Unwin, Ltd. 7s. 6d.)

THERE are plenty of people in Europe who will tell you that a war between Germany and Poland is among the least likely of European conflicts. But Mr. Tunstall's war is in 1954 and is of an ultra-modern variety in that it is brought about by the machinations of international dope rings, so the opinion of common or garden political students can conveniently be disregarded.

Whatever his shortcomings the author is courageous. He wades into the thick of European strife to point out to us the most minute details of its progress and discourses methodically on its conduct. Nor does he shirk technicalities. Are not the aeroplanes used by the International Air Police (the intervention of which force is really the basis of the story) equipped not only with conventional wings and adjustable rotors, but with cyclogiro "air paddles" of a pattern "practically identical with the ones fitted to the sport planes for blindfold flying"? Of course, the rotors and air paddles are retractable, permitting Schneiderish speeds.

In essentials, if not always in matters of detail, the author reveals outstanding visionary qualities and is obviously at home politically and well versed geographically. His accounts of the conduct of certain of the police officers, whose national feelings well up within them on being called to action, and the descriptions of large-scale sabotage and propaganda make convincing reading.

A provocatively detailed work for the entertainment and stimulation of the moderns.

The Alvis Engine Range

IT is announced that production of Alvis aero engines at the finely equipped new factory at Coventry is now very near. The first series is expected to be ready to undergo its type tests in September, after which quantity production will begin.

The types to be made, and the type-names chosen, are as follow:—

Alcides I.—1,300-1,400 h.p. double-bank 18-cyl., medium supercharged.

Alcides II.—1,300-1,400 h.p. ditto, fully supercharged.

Pelides I—1,000 h.p. double-bank 14-cyl., medium supercharged.

Pelides II.—1,000 h.p. ditto, fully supercharged.

All are of the air-cooled radial type. The rated altitude of the Alcides will be 5,000 ft., and of the Pelides 13,000 ft.

The Lowe-Wylde Fund

CONTRIBUTIONS to the Lowe-Wylde fund totalled £884 2s. 6d. on July 31, the latest list of donations being as follows:—

	£	s.	d.
Messrs. Bruntons (Musselburgh) Ltd. ...	4	4	0
Louis Bamberger & Sons	3	3	0
Major C. M. Carington	2	2	0
Capt. E. F. Briggs	1	1	0
C. H. Brooks	1	1	0
H. Burroughes	1	1	0
F. Beckell	1	1	0
S. E. Clotworthy	1	1	0
S. A. Currin	1	1	0
H. R. Gillman	1	1	0
F. V. Brown	0	10	6
E. W. E. Simpson	0	5	0

Further contributions to the fund (which is to provide for the children of the late Mr. C. H. Lowe-Wylde, the ultra-light-aircraft pioneer) are still urgently required, and should be sent to Mr. E. C. Gordon-England at the London Air Park, Feltham, Middlesex.

War Without the Trimmings

Sagittarius Rising, by Cecil Lewis. (Peter Davies, Ltd., 30, Henrietta Street, London, W.C.2. 8s. 6d.)

JUDGED on a basis of modern literary merit alone, *Sagittarius Rising* is in the front rank of flying books and, particularly, war-flying books. As a personal history it is enlightening, and as a piece of quiet anti-war propaganda (using the expression in the real and not the new "pacifist-baiting" sense) it is superb. Mr. Lewis's descriptive writing gives a more accurate idea of a pilot's feelings, outlook and physical viewpoint than that of any author which we have so far read, and it is almost impossible to realise that his flying experiences in Europe and the Far East were all obtained before the ripe age of twenty-four.

In such circumstances, the most effective way of explaining the book is to quote parts of it.

The author's opinions of war and its futility can be suggested in a few lines: "Indeed, the fearful thing about the war became its horrible futility, the mountainous waste of life and wealth to stake a mile or two of earth . . . it had all the elements of grotesque comedy—a prodigious and complex effort, cunningly contrived, and carried out with deadly seriousness, in order to achieve just nothing at all." Of civilisation he says, "... to treat it as a carcase off which each man tears as much as he can for himself, is to stand convicted as a brute, fit for nothing better than jungle existence, which is a death-struggle leading nowhither. . . ." No one who reads his description of the blind, disgusting fury of a long-period bombardment and the prodigious and wasted bravery on both sides can treat war as a matter for jest. Of flying itself Mr. Lewis says, ". . . Men! Standing, walking, talking, fighting there beneath me. . . Why, God might take the air and come within a mile of earth and never know there were such things as men. Vain and heroic gesture, puny the great thought! . . . the wonder at first coming out above the clouds the rush of engines starting . . . shadows of clouds on hills . . . friends, close in formation, swaying, hand on throttle, as they ride ten feet away a mile above the earth . . . and all the mastery over movement pride in skill." His description of an evening patrol and consequent dog-fight is one of the finest that have ever been written of air warfare.

Private Flying

Topics of the Day

Long Range

FOR many years the least attractive feature of almost any light aeroplane was its totally inadequate range. In England, where—despite the howls of the air-minded—there was, even then, a very reasonable selection of Service and civil aerodromes for the benighted pilot, a safe endurance of some three or three-and-a-half hours was just adequate. Few pilots would, however, venture on a Continental tour without the comforting addition of an extra tank in case of strong headwinds, or in case bad weather suddenly cropped up when the pilot was well beyond the half-way mark on a long stretch devoid of emergency landing grounds. For there are vast stretches abroad where not a single suitable field can be picked out even for an emergency landing.

Now, however, matters are different, though there are still one or two manufacturers who may be losing prospective customers for their machines simply because these have only a semi-adequate range.

The other day, for my own interest and amusement, I made out a list of fifteen fairly representative light aeroplanes, including both luxury twin-engined machines and "ultra-lights," and added up their ranges and endurances. The average of the whole lot came to the interesting figures of 515 miles and 4.55 hours respectively—which automatically gives an average speed of 113.2 m.p.h.

These figures are extremely good, though they have been helped out by six exceptionally good machines—one, the Dragonfly, having a range of 885 miles and an endurance, with full tanks, of 6.8 hours. I must say that when I had a chance of flying this machine it was extremely pleasant to lean back and realise that the South of France was within non-stop range in normally good conditions.

Mental Comfort

NEEDLESS to say, the average pilot does not want to fly for a solid six hours or so, but the point is that if, during a long flight (particularly over sea), the weather *does* close in, one has a chance of getting back to the area which is known to be in good order. If radio is carried, one can go forward towards better weather with the knowledge that it is still possible to fly all the way back again if necessary.

In the ordinary way a pilot does not, of course, leave with brim-full tanks for a destination only fifty miles away, but it is nice to know that the capacity is there when necessary. Long ago, in an ancient light aeroplane, I made two refuelling stops during a flight of two hundred miles, simply because, with the strong prevailing headwind, I could not be certain that the next aerodrome could be reached. Nor have I ever forgotten the hypnotic attraction of a float-type gauge which registered zero over the hills around the Wye Valley. Though I knew perfectly well that there should be at least five gallons in the tank, one can never feel certain at such moments that it has been refilled properly, and the faintest smell of petrol suggests a leaking tank.

Even to-day fuel gauges are not often everything that they should be. If they are good they are usually badly placed; and if they are well-placed they so often indicate a quixotic assortment of levels while passing through bumpy air.

Once again I am reminded of a personal experience; in this case the tank *was* leaking quite remarkably well—so well that the machine shed a plume of white "smoke"—and the gauge chose this moment to tear my nerves to pieces by indicating "0" and "15" alternately while I returned to the home aerodrome. Let us quietly forget those largely obsolescent machines from the cockpit of which it was not *possible* to read the gauge, this being designed and placed only for the benefit of the ground engineers. Shades of the days when I carried in my car a marked piece of wood with which I probed the dark depths of the tank!

Maps and Things

AT one time or another all manner of reasons have been produced for the increased popularity of the cabin type of machine. Some of these reasons have been good and others have been partly nullified in actual practice, but the most important advantage is rarely mentioned. In a cabin machine one can wield maps with safety and satisfaction and throw them carelessly into the rear seat or luggage compartment as soon as they are done with.

How many of us have been in an awkward position when the weather has forced a sudden deviation of course while flying an open machine? The maps have all been folded, perhaps, to cover a certain track, and it is often impossible to refold them in such a way that even a glimpse of the area away from this track can be obtained. Once, I have even had to land because I had accidentally folded my map in the wrong way and readjustment was impossible without completely unfurling the sheet.

On at least two occasions I have lost maps overboard, once when a really violent bump occurred while in the act of changing them, and once when a temporarily unwanted section was placed in the inadequate dash locker. Most of us have lost one down the fuselage at least once.

The fact was that designers of open machines very rarely bothered to provide any kind of accommodation for one's maps, C.D.C.'s and course calculations. We were, therefore, forced to accommodate them about our persons, and it was (and is) the dickens of a job to find the right one, hampered as we were with speaking tubes, Sutton harness, leather coats, control columns, and so forth.

All designers of private machines should be forced to make cross-country flights in bad weather over country which involves the use of a maximum number of map sections. There is still room for improvement.

INDICATOR.

Private Flying

FROM the CLUBS

Events and Activity at the Clubs and Schools

ABERDEEN

MISS CRUICKSHANK, having gone solo, is the first woman in the North British Aero Club to do so. Sir Alisdair McRobert is in Aberdeen for six months with his B.A. Eagle and has joined the Club.

Y. A. S.

New members are: Mr. and Mrs. Netherwood, Dr. Cameron, and Messrs. Armstrong and Campbell. Last week's flying time was 88 hr. 45 min.

DONCASTER

Club machines flew 26 hr. 35 min. during the week ending August 14. Mr. G. R. Guest became a member and Mr. E. D. Harris-St. John carried out his "A" licence tests.

NORTHAMPTONSHIRE

The return of holiday-makers and improved weather have resulted in increased flying times at Sywell. Messrs. H. Deterding and G. Linnell have returned from the Olympic games. On August 12 Mr. S. P. Tyzack and Miss Vera Smith were married at Newport Pagnell. Three of the Club's private owners flew to the ceremony.

MIDLAND

Mr. C. H. Boreham has gone solo and Mr. J. Round has passed his "A" licence tests. Messrs. E. E. Hughes-Williams and M. L. Marsh have joined as flying members and Messrs. G. E. Beharrell and H. P. D. Van-Asch as ordinary members. Last week's flying times were 30 hr. 15 min. dual and 38 hr. 55 min. solo and passenger.

HANWORTH

Hanworth plans to turn out in force on Sunday, August 30, to defend their domain against a Dawn Patrol. Major Duncan, Father Wright, R. C. Cater and H. W. Moody (National League of Airmen) have passed their "A" licence tests, and Dr. T. Leader has become a member. Last week's flying times totalled 91 hr. 35 min.

BORDER

With the arrival of the new Gipsy II Moth flying is once more in full swing and lost ground is rapidly being made up. Mr. Harold Carr, the President, made a tour in the Hornet last week to Liverpool, Bristol, Christchurch, Southampton and back via Cambridge and Leeming. Messrs. Cookson, Thomson and Robinson have completed their "A" licence tests.

YAPTON

The Club will hold a "cocktail patrol" at noon on the 23rd to be followed by a demonstration of the Super Drone. Flying times for the period August 1-15 totalled 123 hr. 10 min. Mr. M. S. Freeman has gone solo and passed his "A" licence tests and Messrs. McCormick-Goodhart, Paviour-Smith, K. Visvånath, and Flt. Lt. R. L. Bennet have become members.

SOUTH COAST

The Club exceeded forty hours' flying last week, the weather having improved considerably. Mr. A. H. Beadle has gone solo and Mr. L. Bellairs has put in the time to renew his "A" licence. There has been a good entry list for the Gorringe Challenge Trophy landing competition. New members include: Mrs. White, Mrs. Cook, Messrs. W. H. Symes. C. W. Luin, and F. J. Freeman.

NORFOLK AND NORWICH

Extensive aeronautical entertainment was organised for a number of lads from the Watts Naval School who visited the Club. Ninety-six hours' flying was logged last week—by far the best total this year. Flying by the Public Schools Aviation Camp contributed largely to this figure. Lord Walpole has gone solo. At the camp Messrs. P. G. F. Fletcher, H. D. Freeth, H. Parkinson and R. R. Cobley have also gone solo.

REDHILL

The bombing competition against Maidstone will be held on Sunday, August 23. There are five new members. Flying time for the week ending August 14 was 101 hr. 25 min.

READING

New pupils include Mr. and Mrs. Tyson and Mr. Bingham. Two more Nighthawks have left for Roumania. On Sunday, Club members presented Flt. Lt. "Tommy" Rose with a handsome stand in onyx comprising a combined cigarette box, calendar, fountain pen holder and pen. A party held on Saturday for the Northesk Cup Competition was a great success. Last week's flying time was 36 hr.

LONDON

The aerobatic and forced landing competitions will be held on August 29, the map-reading competition on the following day and the navigation competition on September 6. Last week's flying time was 185 hours. Messrs. L. P. Hill and R. L. Porteous completed their night flights and Messrs. D. M. Masson and E. Koenigs went solo. New members are: Mrs. F. Kein, Mrs. D. R. Robertson, Miss A. Lambe, Baron Koenigswarter, Messrs. K. Alsop, E. Elton, C. E. Cutts, G. R. Onions, G. S. Philpotts, W. N. Ward, J. L. Waters and L. Windstrand.

BROOKLANDS

Last Sunday week was a record day for the Club; 40 hr. 40 min. flying was recorded. Mr. R. G. J. Nash has been airing his Bleriot monoplane and has reached a height of about 10 ft. The machine is of 1909 vintage and uses its original 3-cylinder Anzani engine. Mr. Nash rebuilt the machine in his workshops on the aerodrome. New members are: Messrs. S. G. Harper, Cotts, K. Anderson, Fuller, P. H. Buckingham Lillingston, A. C. Henus and L. F. Leversedge. Messrs. J. W. Burrows and H. Creedy have gone solo. Mr. Booth has finished all his "A" licence tests, having started instruction only five days previously. Mr. Jules Valetta was successful in his Second Class Navigator's examination. He was a pupil of Mr. R. Ashton, the Club's navigation instructor.

ATLAS

Mr. Richard Beaumont, whose family owns the Island of Sark, has gone solo. The flying time for the period August 1-15 is 57 hr. Mr. Bellamy has become a pupil and contemplates taking his "A" licence. Mr. Patrick Knowles, the film star, is another new pupil. "Paddy" Flynn has delivered "EO" to Norwich and handed it over to Dr. Burchall, who is in charge of the Public Schools Aviation Camp. Dr. Burchall lost a leg while learning to fly, but after recovery had it replaced by a "tin" one and secured his "A" licence. This accident happened before "Paddy" Flynn had his crash and "Paddy" says "the letters that Dr. Burchall wrote to me in hospital while I was recovering gave me renewed hope and the belief that I would fly again." Work at Abridge is progressing favourably and it is hoped to open up there very shortly.

CINQUE PORTS

Last week was an amusing one, for No. 601 Squadron, A.A.F., was at Lympne. On arrival at the Club on Wednesday morning the bar was found to be full of very live rabbits which had been comfortably bedded down there in the small hours. The Club endeavoured to repay this generosity by sending the mess a parcel of very mixed gifts—price 7s. 6d. C.O.D. Having painted Lord Patrick Crichton-Stuart's Hendy Hobo in Lord Patrick's racing colours, the Club was naturally delighted when it came back on Saturday with the first prize for open machines at the Eastbourne Concours D'Elegance. The Rev. C. D. C. Boulton, the "flying parson," is now operating at Littlestone and the Club is housing his machine and signing it out daily. The recent almost-fine spell produced a crop of "A" licences, these being taken by Surg. Cdr. Price, Mr. Temple, Mr. Strouts, Col. Ward and Mr. Hilton-Simpson. New members last week were: Messrs. C. J. Broadley, L. M. J. Balfour, and P. G. Hyde.

Forthcoming Events

August 22. Midland Aero Club: "At Home" and Contact Air Race.
August 28-29. Southend Flying Club: Week-end "At Home."
August 29-30. Cinque Ports Clubs: International Rally and Wakefield Cup Race.
August 29-Sept. 6. British Gliding Association: Annual Competition, Gt. Hucklow, Derbyshire.
August 30. Gordon Bennett Balloon Race, Poland.
September 4-5. Magyar Athletic Club Motor Section: International Flying Meeting.
September 5. Bristol and Wessex Aeroplane Club and Bristol Branch, R.Ae.S.: Garden Party.
September 5-6. Aero Club of Hungary: Week-end Aerien.
September 12. London Aeroplane Club: Hatfield Garden Party.
September 13. Aero Club de France: Coupe Deutsch Race.
September 19. Cardiff Aeroplane Club: London-Cardiff Race.
September 19. Three Counties Air Race, Hereford.
September 20. London Air Park Club: Display.
September 29. London-Johannesburg Race.
October 25. Aero Club de France: Saigon Race.
November 13-29. International Aero Exhibition, Paris.

HESTON

Aeroplanes from the Heston flying school may now be hired for cross-country work at a flat rate of £4 4s. a day, fully insured, hirer to provide petrol and oil. No extra charge will be made for keeping the machine away overnight, provided it is brought back to Heston by 10 a.m. the following morning.

BRISTOL

Mr. and Mrs. H. D. Raynham and Mr. I. G. Duncan have become members and Mr. P. R. Scott has gone solo. Last week's flying time was 44 hr. 45 min. Mr. D. Stewart-Clark, of the Scottish Club, and Mr. B. Heath of the Cambridge Air Squadron have been flying the Club's Cadet.

C. A. S. C.

The majority of the 5 hr. 10 min. flying logged last week was in connection with service work at Portsmouth. Two machines visited Broxbourne and Messrs. Harris and Arrighi took trial lessons to qualify for probationary membership.

CAMBRIDGE

Marshall's Flying School, The Cambridge Aero Club and the University Aero Club flew 110 hr. during the week ending August 16. Mr. Buchanan and Mr. Hutchinson took their "A" licences and Mr. Worsdel passed the flying examination for his "B" licence.

The Rand Race

THREE more entries for the London-Johannesburg Race were added to those published in *Flight* last week when entries closed at ordinary fee last Friday. The official entries list issued by the Royal Aero Club now numbers twelve machines, but it is possible that a few more will be added when the list closes finally on August 28. The three additions are a B.A. Eagle, entered by C. G. M. Alington, and to be piloted jointly by him and Lt. P. H. Booth, R.N.; a Miles Peregrine entered by Bateman Scott, and to be piloted by Flt. Lt. H. R. A. Edwards and Sqd. Ldr. B. S. Thynne; and a Percival Vega Gull entered and presumably to be piloted by Mr. John Carberry.

The Brisbane-Adelaide Race

FINAL plans have now been made for the Centenary Air Race from Brisbane to Adelaide—a distance of 1,440 miles. The event will be run in two sections on speed and handicap. The winner of the handicap race will receive £500 and £250 will be given to the first in the speed contest. Both races will finish the same day, December 18. Altogether eight prizes will be given.

The machines in the speed section will leave Brisbane at 4 a.m. on December 18, and there will be compulsory stops for refuelling at Melbourne and Sydney. There will be at least fifteen machines from New South Wales and nine from Queensland.

Lympne's Big Meeting

PLANS are being rapidly developed for the Cinque Ports International Rally and Wakefield Cup meeting on August 29 and 30, and by the time this paper appears there will be exactly twenty-four hours for intending competitors in the race to send in their entries at normal fees. Entries at double fee may be sent in up to next Monday morning.

The course for the Wakefield Cup race will be the same as that used last year and, apart from the trophy, there will be prizes of £50, £25 and £10 for the three leaders and the Yates trophy for the pilot making the fastest time. The heats will be run off on Saturday, August 29, and the finals on Sunday. Lord and Lady Willingdon will be present and will give away the prizes.

So far as the International Rally is concerned, a number of famous foreign pilots have already signified their intention of coming over, amongst them being Dipl. Ing. Kropf, who is bringing over a Focke-Wulf Stösser, and Faul Fürster.

Hereford Comes in

ON September 18 and 19 a flying meeting and handicap air race over three laps of a triangular course between Hereford, Gloucester and Worcester, is being organised. A cash prize of £50 and the Hereford City Trophy goes to the winner, with two other trophies and £30 and £15 for the second and third finishers. The pilot making fastest time, the first lady finisher and the first pilot flying a machine with an all-up weight of less than 800lb. to finish will each be awarded a trophy. The race will start at 11 a.m. on Saturday, September 19, and all normal entries must be in by first post on September 12; late entries at double fees can arrive by first post on September 18.

The "base camp" will be the old racecourse at Hereford, which is being cleared by the city council, and will be officially recognised by the Air Ministry as a landing ground; the runs are about 800 yards in each direction.

Unfortunately, the organisers have not noticed that the London-Cardiff race is due to be held on the same date, and, as this is something of a classic, it is likely to take all the entries. Perhaps the Hereford show can still, in the circumstances, be dated back a week.

Pilots and manufacturers who are interested should write to Mr. J. Buckley, c/o Thorne's, Ltd., Commercial Road, Hereford. The organisers are Western Aircraft Sales, Ltd., 18, The Butts, Worcester.

A Dunkerque-Malo Rally

THE Aero Club of Dunkerque will organise a rally on August 29 and 30 at Dunkerque. The arrangements include a banquet and ball on the Saturday evening in the Casino, given by the Municipality of Malo-les-Bains, and a flying exhibition and fête on the Sunday. Further particulars may be obtained from the Royal Aero Club, 119, Piccadilly, W.1.

The Navy is at Home

FOLLOWING the Eastbourne affair on Saturday, the Royal Naval Flying Club held an At Home at Portsmouth airport on Sunday, and a number of the machines which were at the former were simply flown down the south coast to the second event after lunch on Sunday. Once again the weather was perfect.

At 3 p.m. the novices' landing competition was held. This was for those pilots with less than fifty hours' solo flying to their credit and the winner was Lt. A. W. Rainey, Royal Marines. Afterwards there was a bomb-dropping competition. This was won by Lt. J. W. Hale, R.N., his winning bomb being only 5½ yards from the target. Flt. Lt. Williams, the Portsmouth Aero Club's instructor, then put up a clean aerobatic display which was followed by a height-guessing competition. This was won by one of the visitors, Mr. A. G. Howard.

Thereafter there were demonstration flights by visiting machines, including a Heston Phœnix, a Kronfeld Drone, a Short Scion, a C.30 Autogiro, a Monospar, an Aeronca, a Taylor Cub, and, of course, an Airspeed Envoy working on home ground. After the demonstrations the prizes for the competitions were presented by Mrs. C. E. Kennedy-Purvis, the wife of Rear-Admiral Kennedy-Purvis, chairman of the Royal Naval Flying Club. The afternoon concluded with passenger flights for those who wished to take them.

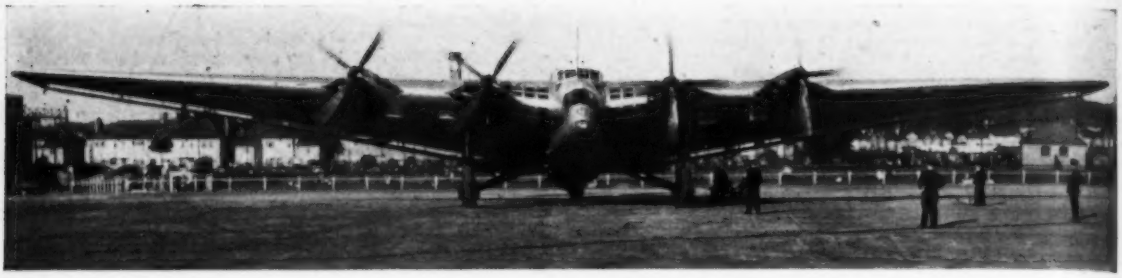
Aspirations and Inspirations

From Heston to the High Alps, by Douglas Fawcett (*Macmillan*, 6s.).

ONCE again the reading public is firmly reminded that neither the art of learning to fly nor its natural consequences are for the young man alone. At an age little short of seventy years, Mr. Douglas Fawcett learnt to fly at Heston, and made use of the aeroplane to re-discover the mountains which he climbed as a younger man. "All possessing fairly keen senses," he says, "sound circulatory and nervous systems and pluck can learn to fly." Of the delights of flying, he says, "I am of that age at which emotions are supposed to become placid, but I never go up without elation, pure and undefiled, and, with blue sky overarching my flight and wisps of cloud brushing the wings, I envy no man."

The first part of this charming little book is devoted to the story of his experiences and impressions as a pupil. Although one might expect it to do so, this section does not clash in any way with Mr. Filson Young's recent book, but, without belittling our high regard for Heston's teaching, it would be nice to read a book by someone who was trained elsewhere! Mr. White's *England Have My Bones* is the only exception we can call to mind.

Best of all things in the book are the Alpine photographs—and, in particular, those of the Matterhorn and its plume of cloud. Those who know Mr. Fawcett hope that he will purchase a twin-engined machine for Alpine flying, though, even with a single engine, this sport may be less dangerous than guideless mountaineering. However, if we bothered eternally about relative risks, we should never dare to cross a busy street.



DIESEL-ENGINED AIRCRAFT at CROYDON

The Junkers G.38 Does London-Berlin Non-stop

ON Monday evening the Deutsche Lufthansa A.G. gave an enjoyable little party at Croydon to a number of important people, including members of the German Embassy in London and the heads of the various travel agencies. The centre of interest was the D.L.H. flagship, the Junkers Ju./G.38, a gigantic aeroplane with a wing span of 146ft., a total weight fully loaded of approximately 53,000 lb., and a cruising speed of around 131 m.p.h. This most impressive aeroplane, the *General Field Marshal von Hindenburg*, has engine rooms and passenger seating actually in the thickness of the wings. Stand below it and you look up to what seems to be the prow of a ship made of shining metal. I know no aeroplane which gives quite the same impression, though some of our Empire flying boats may, as they certainly should, have a more nautical air about them.

The machine is by no means new, being about the same age as the *Heracles* type, but its present interest lies in the fact that it was formerly petrol-driven, whereas now its four huge four-bladed wooden propellers are driven by four Junkers 750 h.p. Jumo IV engines burning heavy oil. This is at once apparent as you watch the machine take off, for it leaves four trails of thick smoke behind such as would cause engineers acute uneasiness in a petrol-driven craft. There is also a mysterious smell about the machine, reminding most middle-aged people of youthful loitering on railway stations near the porters' lamp room about dusk.

To fly in the big aeroplane is unlike anything else if you sit anywhere above the great wing, which tapers away like a fairly big section of an arterial road, and, it must be confessed, obscures most of the view except from favoured seats. The cabins are comfortable, but internal decoration is plain to the point of severity, and the size of the whole fuselage is made apparently greater by the number of odd cabins, to most of which one seems to walk either up or down stairs. The same is observable in rambling old coaching inns.

It has not been found possible to ascertain the extent, if any, to which pay load has had to be reduced to make up for the heavy diesel engines. An effort is being made to take advantage of them by flying Berlin-London non-stop.

An interesting visitor to Croydon early this week was the huge Junkers G.38, shown in front view at the top of the page. The machine originally had petrol engines but has now been fitted with four Junkers diesels. The neat cowling of these large engines is shown in the picture on the right. (*Flight* photographs.)

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

CHANGES IN THE HIGHER COMMAND

The Air Ministry announces the following appointments:—

Air Vice-Marshal Ernest Leslie Gossage, D.S.O., M.C., to be Air Officer Commanding, No. 11 (Fighter) Group on September 7, 1936, vice Air Marshal Philip Bennet Joubert de la Ferté, C.B., C.M.G., D.S.O.

Air Commodore Conway Walter Heath Pulford, O.B.E., A.F.C., to be Superintendent of Royal Air Force Reserve and Inspector of Civil Flying Training Schools on September 21, 1936, vice Group Captain Robert Leckie, D.S.O., D.S.C., D.F.C., A.D.C.

Group Captain Robert Leckie, D.S.O., D.S.C., D.F.C., A.D.C., to be Director of Training at the Air Ministry on October 5, 1936, vice Air Commodore Arthur William Tedder.

Air Vice-Marshal Gossage was appointed to a commission in the Royal Field Artillery in 1910 and was seconded to the Royal Flying Corps as a Flying Officer in 1915 after graduating at the Central Flying School. During the Great War he served in France and for his services he received the D.S.O. and the M.C., besides being mentioned in despatches on four occasions. In August, 1919, he was appointed to a permanent commission as a Squadron Leader in the Royal Air Force on resigning his commission in the Army.

Since the Great War, besides commanding the School of Army Co-operation, Air Vice-Marshal Gossage has passed a course at the Staff College, Camberley, and in 1925 he became a member of the directing staff at that College. In 1928 he was appointed Deputy Director of Staff Duties at the Air Ministry and two years later he became Air Attaché at His Majesty's Embassy in Berlin. Subsequently he held appointments as Senior Air Staff Officer, both at home and in Iraq, until he became Air Officer Commanding British Forces in Aden in December, 1935.

Air Vice-Marshal Gossage was promoted Wing Commander in 1921, Group Captain in 1928, Air Commodore in 1932, and to his present rank in January, 1936.

Air Comdre. Pulford entered the Royal Navy in 1910, became a Flight Lieutenant in the Royal Naval Air Service in 1914, and graduated at the Central Flying School the following year. For his services with various units afloat during the Great War he received the O.B.E. and the A.F.C., besides the French Croix de Guerre. In August, 1919, he was granted a permanent commission in the Royal Air Force, as a Squadron Leader.

Since the Great War, Air Comdre. Pulford has commanded several Royal Air Force units, and after passing a course at the Royal Air Force Staff College was, in 1923, employed on Air Staff Duties at the Air Ministry. Subsequently he completed a course at the Imperial Defence College and commanded the Station Headquarters, Heliopolis, from 1932 until 1934, when he was appointed to command the Air Armament School.

Air Comdre. Pulford was promoted Wing Commander in 1925, Group Captain in 1932, and to his present rank in July, 1936.

Group Capt. Leckie was commissioned in the Royal Naval Air Service in 1915 and during the Great War served conspicuously in coastal defence units, gaining the D.S.C., D.S.O., and D.F.C. for his services in action against invading enemy airships and submarines. In 1919 he was seconded to the Canadian Air Force and for three years held the appointment of Director of Flying Operations at the Canadian Air Board. On his return to the Royal Air Force in 1922 he was posted to the School of Technical Training (Boys), Halton, and later attended a course at the Royal Naval Staff College. Subsequently in 1923 Group Capt. Leckie was employed on Technical Staff Duties and as Senior Air Force Officer in H.M.S. *Hermes* in 1926. In 1929 he commanded the Royal Air Force Station at Bircham Newton and No. 210 (F.B.) Squadron in 1931. On appointment as Superintendent of the Royal Air Force Reserve in 1933 he was given the command of the Royal Air Force Station at Hendon. He was promoted Wing Commander in 1926 and to his present rank in 1933. He was appointed Air Aide-de-Camp to His Majesty the King in August, 1935.

APPOINTMENT OF AIR ATTACHÉ

Wing Cdr. Harold Spencer Kerby, D.S.C., A.F.C., has been appointed to succeed Group Capt. Robert Peel Willock as Air Attaché to His Majesty's Embassy at Peking at the end of October, 1936.

ANOTHER RESERVE CATEGORY

The Air Ministry announces:—

In order to increase the present reserve of fully trained pilots to meet the requirements of the expanded Royal Air Force a special category of a limited number of reserve pilots will be established in the near future. These reserve pilots on entry will pass through the same full course of training as that attended by pilots of the regular Air Force, lasting for approximately twelve months. They will be trained on elementary and service types of aircraft at civil and service flying training schools. Whilst training at civil schools they will serve under conditions as regards emoluments, leave, etc., similar to those for pupils under training for commissions in the regular Air Force.

On proceeding to R.A.F. Depot when the civil school training is complete, reserve pilots will be appointed to the acting rank of pilot officer (on probation) and will be eligible for confirmation in rank after twelve months' service. Whilst at the R.A.F. Depot and during subsequent service at flying training schools they will receive the emoluments appropriate to their rank. On completion of their period of training reserve pilots will revert to civil life to complete their reserve service.

This scheme is designed to appeal to young men who can spare the twelve months required for training before embarking upon a career and who are able to make satisfactory arrangements regarding their re-employment in civil life after completion of the course of training. In this respect this scheme differs from the scheme for the raising of the R.A.F. Volunteer Reserve, regarding which an announcement was made by the Secretary of State for Air in the House of Lords on July 30 last. The latter scheme is primarily designed to provide less intensive training under conditions which will permit the entry of the candidates in large numbers without interruption of their civil occupations.

Selected candidates under the one-year training scheme will be appointed to commissions in Class A of the Reserve of Air Force Officers for a period of five years' service, and, in addition to attending the initial course of training in their first year of service, they will be liable to attend for not more than twenty-four days' annual training in subsequent years. They will receive a retaining fee of £25 a year for each year after the first. Candidates must be between their 18th and 25th birthdays and must be approximately of the educational standard required for the School Certificate of the Oxford and Cambridge Schools Examination Board. They must be able to give twelve months' continuous whole time attendance for training.

The first course under this scheme will commence early in October next and intending candidates are asked to apply *immediately* to the Secretary, Air Ministry (S.7.e.Reserve), Kingsway, London, W.C.2, for particulars.

No. 4 (ARMY CO-OPERATION) SQUADRON

No. 4 (Army Co-operation) Squadron is located at Ford Aerodrome from August 8 to September 19 inclusive.

FORMATION OF NEW SQUADRONS

No. 83 (Bomber) Squadron formed at Turnhouse on August 4. The unit is being equipped with the light bomber type of aircraft and has been placed under the command of the A.O.C.-in-C., Bomber Command, in No. 2 (Bomber) Group.

No. 151 (Fighter) Squadron formed at North Weald on August 4. The unit is being equipped with fighter aircraft and has been placed under the command of the A.O.C.-in-C., Fighter Command, in No. 11 (Fighter) Group.

PENSIONED R.A.F. WARRANT OFFICERS AS ASSISTANT STORES AND BARRACK OFFICERS

It has been decided to appoint a small number of pensioned R.A.F. warrant officers (stores and accountant) as civilian assistant stores and barrack officers. The appointments will be subject to one month's notice on either side, and will carry a fixed salary at the rate of £225 a year. The duration of the appointments will depend on general service requirements, and may not exceed two years.

Applications from eligible warrant officers now in the United Kingdom are invited and should be addressed to the Air Ministry as soon as possible.

AUSTRALIAN OFFICERS

The following officers of the Royal Australian Air Force are at present serving on exchange duty with the R.A.F.:—Air Commodore S. J. Goble, C.B.E., D.S.O., D.S.C., Air Officer Commanding No. 2 (Bomber) Group, Abingdon; Wing Cdr. R. J. Brownell, M.C., M.M., second-in-command of No. 3 Flying Training School, Grantham; Sqn. Ldr. J. E. Hewitt, commanding No. 104 (Bomber) Squadron, Abingdon; Sqn. Ldr. E. A. Daley (medical branch); and Flt. Lt. P. G. Heffernan, of No. 101 (Bomber) Squadron, Bicester.

COMMISSIONED PHOTOGRAPHY OFFICERS

It has been decided that warrant officers, photography, shall in future be eligible for appointment to permanent commissions for specialist photographic duties, and the same conditions will apply as for warrant officers appointed to permanent commissions for other specialist duties.

AIR NAVIGATORS' EXAMINATION

The following candidates have passed the examination for the First Class Civil Air Navigators' Licences held in London during the week commencing June 29:—Cumming, W. N., Fergusson, S. M., Powell, G. J., and Richardson, N. Ten candidates sat for the examination.

R.A.F. BENEVOLENT FUND

The usual meeting of the Grants Committee was held at Iddesleigh House on August 10. Mr. W. S. Field was in the chair and the other member of the Committee present was Group Capt. C. H. K. Edmonds, D.S.O., O.B.E. The Committee made grants to the amount of £276 5s. 5d. The next meeting was fixed for August 24.

CENTRAL FLYING SCHOOL

The undermentioned officers have been re-categorised as under:—

A.2 to A.1

Flt. Lts. C. H. Appleton, J. N. Jefferson, R. L. Wilkinson, and H. Pilling, Sergt. King, H. J.

B. to A.2

Flt. Lts. W. W. Stainthorpe and D. J. Eayrs, Sergts. Newton, J. A., and Pitcher, D. J.

C. to B.

F/O. W. R. Cox and Sergt. Sweet, E. E.

FLYING ACCIDENTS

The Air Ministry regrets to announce that P/O. Michael Richard Montagu, Auxiliary Air Force, and Lt.-Col. Arthur Edward Flynn Fawcus, D.S.O., M.C., T.D., Territorial Army Reserve of Officers, lost their lives in an accident which occurred at Pagham, Sussex, on August 10, to an aircraft of No. 604 (County of Middlesex) (Fighter) Squadron.

P/O. Montagu was the pilot of the aircraft and Lt.-Col. Fawcus the passenger.

The Air Ministry regrets to announce that F/O. Henry Molyneux lost his life in an accident which occurred at Wickham, Hampshire, on August 11, to an aircraft of No. 801 (Fleet Fighter) Squadron. F/O. Molyneux was the passenger of the aircraft and Sqn. Ldr. Bryan Vernon Reynolds, who was not injured, was the pilot.

Also that Sergt. Robert Simpson Horn and Corpl. Oscar Wren lost their lives in an accident which occurred near Princes Risborough, Buckinghamshire, on August 12, to an aircraft of No. 57 (Bomber) Squadron, Upper Heyford. Sergt. Horn was the pilot of the aircraft and Corpl. Wren the passenger.

ROYAL AIR FORCE GAZETTE

London Gazette, August 11, 1936

General Duties Branch

A. M. N. de Lavison is granted a short service commission as a Flying Officer on probation in the Supplementary List with effect from July 11 and with seniority of May 8, 1934.

The following are granted permanent commissions as Pilot Officers with effect from July 22 and with seniority of April 22, 1935:—J. W. Dallamore, J. A. G. Gordon.

The following Flying Officers are promoted to the rank of Flight Lieutenant with effect from the dates stated:—G. W. Montagu (July 11); G. P. Woodhouse, F. W. Dixon-Wright, W. S. P. Simonds, A. W. Sweeney (July 28).

Flt. Lt. (Acting Sqn. Ldr.) R. J. Montgomery-Moore relinquishes the acting rank of Squadron Leader on ceasing to be employed as British Liaison Officer, Beirut (June 27); Lt.-Cdr. S. Borrett, R.N., Acting Flt. Ltd., R.A.F., relinquishes his temporary commission on return to Naval duty (July 20); Lt.-Cdr. D. G. F. W. Macintyre, R.N., Flying Officer, R.A.F., relinquishes his temporary commission on return to Naval duty (November 27, 1934). The short service commission of Acting Pilot Officer on probation B. D. Griffin is terminated on cessation of duty (July 15).

Accountant Branch

Flt. Lt. D. F. A. Clarke is placed on the retired list at his own request (July 25).

Medical Branch

The commission of F/O. D. W. I. Thomas is antedated to August 17, 1935, and he ceases to be seconded to St. George's Hospital with effect from July 1. (Substituted for the notification in the *Gazette* of July 21.)

Memoranda

The permission granted to Sec. Lt. J. A. Lawrence to retain his rank is withdrawn on his enlistment into the ranks of the Territorial Army (May 6); Flt. Lt. L. J. Riordan, A.F.C., is removed from the Retired List (July 28).

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

The following Flying Officers are transferred from Class A to Class C on the dates stated:—G. N. Roberts (August 6); D. L. Townsend (April 20); H. A. Yeo (May 22).

F/O. H. P. McClean is transferred from Class AA(i) to Class C (May 29).

AUXILIARY AIR FORCE

General Duties Branch

No. 500 (County of Kent) (Bomber) Squadron.—P/O. P. Green is granted a commission in that rank with effect from May 25 and with seniority of November 30, 1935. (Substituted for the notification in the *Gazette* of July 28.)

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—R. E. Saul, to R.A.F. Station, Calshot; to command, 31.7.36.

Group Captain (Acting Air Commodore).—W. A. McClaughry, D.S.O., M.C., D.F.C., to Headquarters, Aden Command, on appointment as Air Officer Commanding vice Air Vice Marshal E. L. Gossage, D.S.O., M.C., 15.7.36.

Wing Commanders.—H. P. Lloyd, M.C., D.F.C., to Special Duty List; seconded for duty as R.A.F. Instructor at Staff College, Camberley, vice Wing Cdr. A. J. Capel, D.S.O., D.F.C., 29.7.36. C. R. Keary, to Headquarters, Fighter Command, Stanmore; for Air Staff duties, 14.7.36. W. D. Budgen, O.B.E., to Headquarters, No. 24 (Trng.) Group, Halton; for duty as Senior Personnel Staff Officer, 10.7.36.

Squadron Leaders.—E. F. Waring, D.F.C., A.F.C., to Headquarters, No. 2 (B) Group, Abingdon; for Air (Maintenance Liaison) duties, 1.8.36. A. D. H. Foster, to Headquarters, Fighter Command, Stanmore; for Signals duties, 14.7.36. F. A. Norton, to Headquarters, No. 24 (Trng.) Group, Halton; for Air Staff (Engineer) duties, 10.7.36. C. T. Walkington, to Headquarters, No. 24 (Trng.) Group, Halton; for Air Staff (Engineer) duties, 10.7.36. A. H. Stradling, O.B.E., to Headquarters, No. 24 (Trng.) Group, Halton; for Personnel Staff duties, 10.7.36. F. J. W. Mellersh, A.F.C., to Headquarters, Armament Group, Eastchurch; for Air Staff (Maintenance Liaison) duties, 10.7.36. J. L. M. de C. Hughes-Chamberlain, to Headquarters, R.A.F., Iraq, Hinaidi; for Personnel Staff duties, 18.7.36. C. J. S. Dearlove, to D.S.D., Dept. of C.A.S., Air Ministry, vice Sqn. Ldr. S. E. Toomer, D.F.C., 31.7.36. T. O. Clogstoun, to Headquarters, Training Command, Market Drayton; for Equipment (Engineer) Staff duties, 10.7.36.

Flight Lieutenants.—P. D. Cracroft, A.F.C., to H.M.S. *Courageous*, 5.7.36. J. B. Altham, to No. 10 Flying Training School, Tern Hill, 27.7.36. J. Cherrill, to R.A.F. Station, Hal Far, Malta, 27.6.36. C. F. C. Coaker, to Headquarters, Fighter Command, Stanmore, 14.7.36. V. S. Bowling, to No. 4 Flying Training School, Abu Sueir, Egypt, 1.8.36. R. J. Clare Hunt, to R.A.F. Station, Heliopolis, Egypt, 22.7.36. G. B. Beardsworth, to No. 36 (T.B.) Squadron, Singapore, 1.8.36. G. A. R. Muschamp, to Headquarters, No. 24 (Trng.) Group, Halton, 4.8.36. G. Bartholomew, to No. 504 (County of Nottingham) (B) Squadron, 4.8.36. D. G. Keddie, to R.A.F. Station, Gosport, 4.8.36. J. H. Woodin, to No. 214 (B) Squadron, Andover, 3.8.36. R. J. O. Bartlett, to R.A.F. College, Cranwell, 5.8.36. G. F. Whistondale, to No. 215 (B) Squadron, Upper Heyford, 5.8.36. G. D. Emms, to D.D.R.M., Dept. of A.M.R.D., Air Ministry, 6.8.36. R. J. Legg, to Central Flying School, Upavon, 6.8.36.

Flying Officers.—F. D. Nugent, to R.A.F. Station, Manston, 4.8.36. A. M. N. de Lavison, to Headquarters, R.A.F., Palestine and Transjordan; for Air Staff (Intelligence) duties on appointment to a short service commission (Supplementary List), 11.7.36. R. A. C. Carter, to Home Aircraft Depot, Henlow, 29.7.36. H. M. Cox, to Anti Aircraft Co-operation Unit, Biggin Hill, 4.8.36.

Pilot Officers.—J. W. Dallamore and J. A. G. Gordon, to No. 6

Flying Training School, Thornaby; on appointment to permanent commissions, 22.7.36. A. A. Case, to No. 202 (F.B.) Squadron, Malta, 1.8.36.

Acting Pilot Officers.—J. Adam, to No. 214 (B) Squadron, Andover, 5.8.36. J. Culliford, to No. 57 (B) Squadron, Upper Heyford, 5.8.36. A. C. Douglas, to No. 1 (F) Squadron, Tangmere, 5.8.36. R. D. C. Gibson, to No. 21 (B) Squadron, Abbotsinch, 5.8.36. H. S. Giddings, to No. 65 (F) Squadron, Hornchurch, 5.8.36. G. E. Holdings, to No. 43 (F) Squadron, Tangmere, 5.8.36. C. B. Hull, to No. 43 (F) Squadron, Tangmere, 5.8.36. L. L. Hunt, to No. 15 (B) Squadron, Abingdon, 5.8.36. R. G. Hurst, to No. 57 (B) Squadron, Upper Heyford, 5.8.36. C. E. Johnson, to No. 15 (B) Squadron, Abingdon, 5.8.36. G. D. Jones, to No. 97 (B) Squadron, Boscombe Down, 5.8.36. B. P. King, to No. 23 (F) Squadron, Biggin Hill, 5.8.36. M. J. Loudon, to No. 23 (F) Squadron, Biggin Hill, 5.8.36. D. J. McGlinn, to No. 32 (F) Squadron, Biggin Hill, 5.8.36. W. H. R. N. Newton-Howes, to No. 18 (B) Squadron, Bircham Newton, 5.8.36. R. H. Niven, to No. 38 (B) Squadron, Mildenhall, 5.8.36. A. E. Pringle, to No. 38 (B) Squadron, Mildenhall, 5.8.36. M. L. Robinson, to No. 111 (F) Squadron, Northolt, 5.8.36. K. M. Solanders, to No. 25 (F) Squadron, Hawkinge, 5.8.36. P. A. Tipping, to No. 40 (B) Squadron, Abingdon, 5.8.36. R. R. S. Tuck, to No. 65 (F) Squadron, Hornchurch, 5.8.36 R. D. Baughan, N. C. Beck, R. N. Belgrove, C. H. Boxall, M. H. Brown, E. C. Cathels, R. T. Collier, S. H. Cruise, E. H. Dally, F. R. Jeffs, D. J. H. Lay, W. W. Macfarlane, J. H. G. McArthur, R. A. Milburn, H. G. Mossford, H. O'Neill, T. W. Piper, H. P. Pleasance, D. S. Richardson, T. W. Rowley, K. R. Russell, E. L. Shankland, N. L. Smith, P. P. Troughton-Smith, T. C. Weir, B. R. Whaley, and C. F. S. Wood, all to No. 9 Flying Training School, Thornaby, 18.7.36.

Stores Branch

Squadron Leaders.—H. E. T. Crocker, to Headquarters, Fighter Command, Stanmore; for equipment (Stores) Staff duties, 14.7.36. J. K. McDonald, to Headquarters, Fighter Command, Stanmore; for Equipment (Stores) Staff duities, 14.7.36.

Flight Lieutenants.—G. Scarrott, to R.A.F. Station, Wyton, 30.7.36. E. H. Walker, to R.A.F. Station, Finningley, 30.7.36. H. J. Butler, to R.A.F. Station, Driffield, 30.7.36. J. W. Hunt, to R.A.F. Station, Hucknall, 4.8.36. H. J. Young, M.B.E., to R.A.F. Depot, Uxbridge, 17.7.36. L. Chegwidden, to Headquarters, Fighter Command, Stanmore, 14.7.36.

Flying Officers.—E. G. Moore, to R.A.F. Station, Manston, 7.8.36. C. F. Harrington, to R.A.F. Station, Eastleigh, 6.8.36.

Accountant Branch

Group Captain.—J. Rylands, to Headquarters, Fighter Command, Stanmore; for duty as Command Accountant, 14.7.36.

Squadron Leaders.—R. H. Cleverly, to Headquarters, Training Command, Market Drayton; for Accountant duties, 3.8.36. G. W. Lynn, to R.A.F. Station, North Coates Fitties; for Accountant duties, 7.8.36.

Flight Lieutenants.—A. L. Derry, to R.A.F. Station, Driffield, 30.7.36. W. R. Donkin, to Headquarters Training Command, Market Drayton, 28.7.36.

Flying Officer.—J. G. Wigley, to R.A.F. Station, Finningley, 30.7.36.

Pilot Officers.—D. W. J. Brown, to Air Armament School, Eastchurch, 4.8.36. K. M. Crick, to No. 16 (Army Co-operation) Squadron, Old Sarum, 4.8.36. P. W. Hill, to No. 6 Flying Training School, Netheraven, 4.8.36. J. B. H. Hobin, to No. 101 (B) Squadron, Bicester, 4.8.36. P. N. Isaac, to No. 8 Flying Training School, Montrose, 4.8.36. S. M. MacIldowie, to R.A.F. Station, Finningley, 4.8.36.

Medical Branch

Group Captain.—A. S. Glynn, to Headquarters, Fighter Command, Stanmore; for duty as Principal Medical Officer, 14.7.36.

Wing Commanders.—R. J. Aherne, M.C., to Headquarters, Fighter Command, Stanmore; for duty as Deputy Principal Medical Officer, 14.7.36. W. J. G. Walker, to Princess Mary's R.A.F. Hospital, Halton; for duty as Medical Officer, 1.8.36. V. S. Ewing, to Headquarters, Coastal Area; for duty as Deputy Principal Medical Officer (Hygiene), 14.7.36.

Squadron Leader.—A. Harvey, to Headquarters, Fighter Command, Stanmore; for duty as Deputy Principal Medical Officer (Hygiene), 14.7.36.

Flight Lieutenants.—A. M. Weston, to R.A.F. Hospital, Cranwell, 1.8.36. H. J. Melville, to Central Medical Establishment, London, 4.8.36. G. A. M. Knight, to R.A.F. Depot, Uxbridge, 1.8.36.

Dental Branch

Flight Lieutenant.—H. Keggin, to R.A.F. Station, North Weald, 14.8.36.

Chaplains' Branch

Revd. G. M. Rees, to R.A.F. Depot, Uxbridge; for duty as Chaplain (C. of E.) on appointment to a short service commission, 20.7.36.

THE INDUSTRY

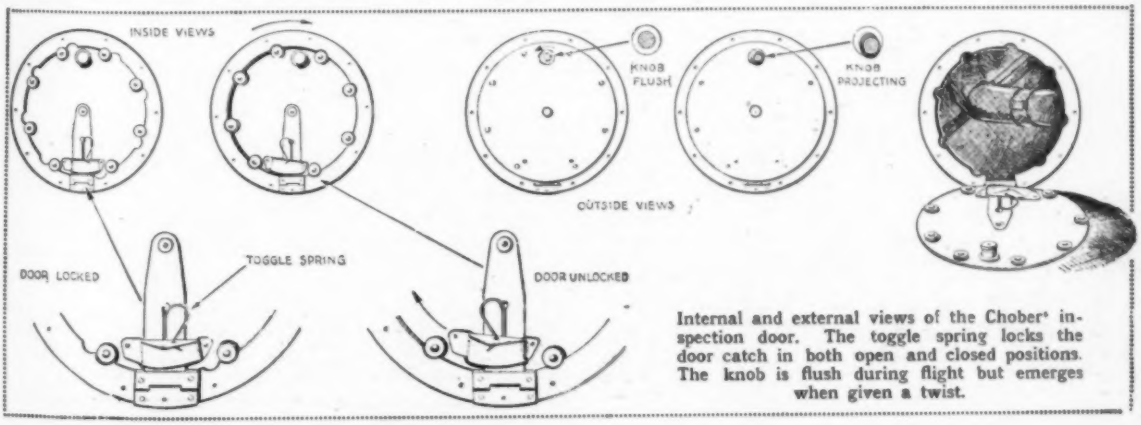
A Neat Inspection Door

IT is by no means as easy as it looks to design an inspection door which combines lightness and simplicity with such features as rigidity, absence of rattle, positive locking and flush fitting. M. Chobert, whose riveting system and rivet "gun" were described in *Flight* of August 6, has designed a door which appears to fulfil all these desiderata. The main features of the Chobert inspection door are shown in the sketches. The door pivots around its centre on a spindle held in an arm of the door hinge. To lock the door, it is shut and moved to the left, when the internal washers overlap the edges of the door frame and hold the door secure against rattling. Turning into the unlocked position is prevented by the toggle wire spring. The door is opened by a short turn to the right, which causes the toggle spring to flick over "dead centre" into the opposite position. The washers are now opposite the cut-aways in the frame, and the door can be opened by swinging it around its hinge.

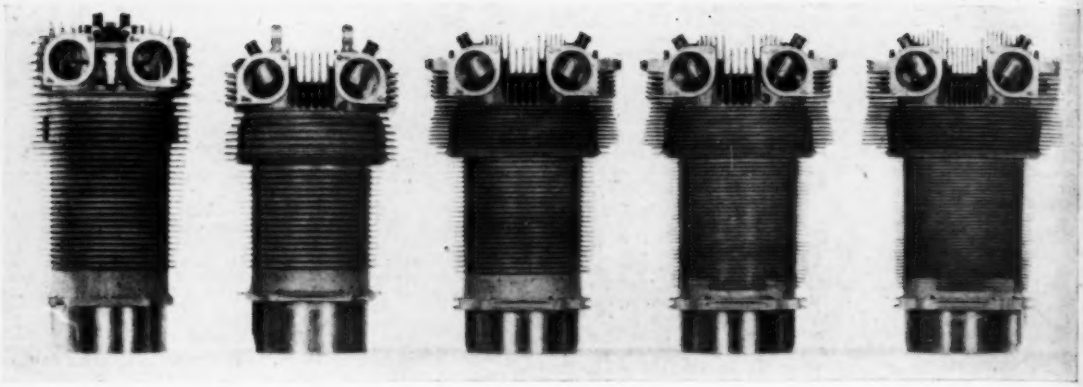
Ingenious as is the door itself, the knob used for opening and closing it adds the finishing touch, so to speak. The end of the knob is knurled, and the knob is free to turn slightly in its socket. A turn to the left releases the knob, which is pushed out by a spring. When shutting the inspection door, the knob is merely pressed in and given a turn to the right with the thumb. This locks it in the "in" position, flush with the surface of the door. A great convenience is that the knob, and consequently the door, can be worked with a gloved thumb. The Chobert inspection door is supplied by the sole concessionaires, Aviation Developments, Ltd., Argyle House, 29-31, Euston Road, London, N.W.1.

Noise that Annoys

SOME rather solemn thoughts are raised on studying "Noise and How it is Measured," one of the series of leaflets published by the Burgess Laboratories. A "decibel chart" starts at zero, "the threshold of audibility," and rising to 8 decibels ("very quiet studio for making sound pictures") takes us on up the noise scale. An "average residence" and



Internal and external views of the Chobert inspection door. The toggle spring locks the door catch in both open and closed positions. The knob is flush during flight but emerges when given a twist.



TEN YEARS OF CYLINDER DEVELOPMENT: (Left) a Bristol Jupiter "pot" of 1926 and (right) one for the latest Pegasus. The increase of fin area, obtained by increasing depth and pitch, has been made necessary mainly by increased power and the use of close-fitting long-chord cowlings. The new Pegasus X has 40 per cent. increase in fin area even as compared with last year's Pegasus III.

a "quiet office" are found between 35 and 40 decibels. A busy street gives 60, a car horn at 23ft. 88, and a pneumatic drill just under 100. It is when we climb to the "over 110 decibels" that the solemn thinking begins, for an "unmuffled aeroplane engine" is a close runner-up to artillery fire, thunder, and the "threshold of painful feeling."

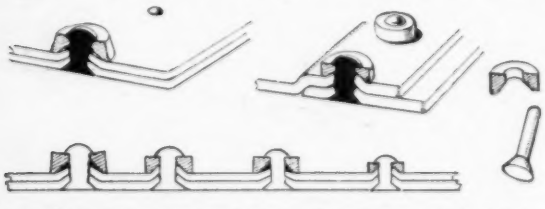
This leaflet and others in the series deal with sound-proofing and silencing, which, as is well known, are specialities of the Burgess Products Company, of Thames House, Millbank, London, S.W.1.

About Electric Furnaces

MANUFACTURERS interested in electric heat-treatment furnaces for such purposes as hardening, tempering, annealing, nitriding, vitreous enamelling, etc., will find a great deal of useful information in a new brochure dealing with the patented "Heavy Hairpin" and "Tubular Hairpin" furnaces made by Wild-Barfield Electric Furnaces, Ltd., Elecfurn Works, North Road, London, N.7.

Flush Riveting

GRADUALLY the practice of avoiding all excrescences on aircraft is being extended to such items as the heads of rivets, and more and more designers are aiming at smooth surfaces on wings and fuselage. When the metal covering is of fairly heavy gauge, the problem presents no great difficulty, and it is usually possible merely to countersink the rivet heads into the actual metal sheet of the covering. When, however, the sheet is very thin, and when, moreover, the supporting member underneath the skin is also of light gauge, simple countersinking is not always possible. Mr. C. H. May, a



The May Flush-riveting System. The lower sketch shows results of using too large washers.

director of Dawn Inventions, 144, Holland Park Avenue, has patented a system whereby flush riveting can be carried out satisfactorily on the thinnest of metal sheet coverings.

The May system consists, as shown in the sketches, in using a cupped or countersunk washer, the cupping having the same shape as the head of the rivet. When the hole has been drilled through the two or more thicknesses to be joined, the rivet is inserted and pressed home either by the use of special tools or with a hammer, the washer being "held up" with a hollow dolly. When the rivet has been driven home and has deformed the sheets of metal, the rivet is headed over the cupped washer. If preferred, the system can, of course, be applied to bolted joints, in which case the nut and lock nut take the place of heading the rivet. Full particulars of the system may be obtained from Mr. May at the address given above. (Telephone, Shepherd's Bush 2882.)

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

PERCIVAL AIRCRAFT, LTD. was registered as a "private" company on August 8, with a nominal capital of £110,000 in £1 shares. The objects are to adopt an agreement with Edward W. Billyard Leake and Edgar W. Percival, to carry on the business of manufacturers of and dealers in aircraft of all types and component parts thereof, etc. The subscribers (each with one share) are:—Mrs. Mary Gardner, 21, Oxgate Court, Oxgate Lane, Cricklewood, N.W.2; Gordon H. Remell, 86, Nightingale Road, Petts Wood, Kent, solicitor's clerk. The first directors are to be appointed by the subscribers. No share qualification required. Remuneration as fixed by the company. Solicitors: Warren, Murton, Foster and Swan, 45, Bloomsbury Square, W.C.1. The file number is 317,324.

WITNEY AERONAUTICAL COLLEGE, LTD. (317,301).—Private company. Registered August 7. Capital, £5,000 in £1 shares. Objects: To acquire the business of a training school for ground engineers and pilots now carried on by Universal Aircraft Services, Ltd., at Witney Aerodrome, Minster Lovell, Oxon. The subscribers (each with one share) are:—E. C. Cornish, 46, Malcolm Road, Coulsdon, Surrey, company director. E. F. S. Hodges, 61, Cheapside, E.C.2, solicitor's clerk. The first directors are not named. There shall be a Board of Governors consisting of a President and Vice-Presidents and not more than 30 other persons. Solicitors: Wingfields, Halse and Trustram, 61, Cheapside, E.C.2.

STANLEY JOHNSON, LTD. (317,289).—Private company. Registered August 7. Capital, £100 in £1 shares. Objects: To carry on the business of engineers and manufacturers and distributors of and wholesale and retail dealers in aircraft, motor cars and other mechanically propelled vehicles, etc. The permanent directors are:—Stanley T. Johnson, 29/31, Euston Road, N.W.1. Albert H. Johnson, address not stated. Qualification: £10 shares. Remuneration: £100 each per annum.

INTERAIR, LTD. was registered as a "private" company on August 6 with a nominal capital of £3,000 in 3,060 "A" and 2,940 "B" shares of 10/- each. The objects are to acquire patent rights of Flight-Lieut. Richard L. R. Atcherley in the new and improved method of transfer and refuelling during transit and flight. The subscribers (each with one "A" share) are:—Leo d'Erlanger, 4, Moorgate, E.C.2, banker. Flight-Lt. R. L. R. Atcherley, R.A.F., Royal Aircraft Establishment, Farnborough, Hants. The directors shall be 5 in number, of whom 3 shall be appointed by the holders of the "A" shares and 2 by holders of the "B" shares. The first directors are to be appointed by the subscribers. Remuneration: As fixed by the company. Solicitors: Slaughter and May, 18, Austin Friars, E.C.2. The file number is 317,235.

AYLESBURY AIRPORT, LTD. (317,217).—Private company. Registered August 6. Capital, £15,000 in £1 shares. Objects: To acquire the business of an aerodrome and flying club carried on by John E. Coxon, at Chilworth Aerodrome, and to enter into an agreement with R. T. Green for the acquisition of certain land at Haddenham, Bucks. The permanent directors are: John E. Coxon, The Hollies, High Street, Thame, aeronautical engineer. Ralph H. Henderson, 22, Clifford Terrace, S.W.14, aeronautical engineer. Qualification: £500 shares. Solicitors: Good, Good and Co., Fairfax House, Fulwood Place, W.C.1.

AERONAUTICAL PATENT SPECIFICATIONS

(The number in brackets are those under which the Specifications will be printed and abridged, etc.).

(*Published August* 6, 1936.)

28381. ARMSTRONG, A. C. H.: Vehicle and aircraft bodies (449,896).
16491. BRISTOL AEROPLANE CO., LTD., FEDDEN, A. H. R., and BARRINGTON, T. B.: Cooling arrangements in supercharged internal-combustion engines (450,047).
7741. SHORT BROS. (ROCHESTER and BEDFORD) LTD., AND CLARKE, A. W. S.: Means for attaching fabric coverings to the metal structure of aircraft frames (450,083).

(*Published August* 13, 1936.)

3139. SERCK RADIATORS, LTD., and UPTON, H. E.: Oil coolers, particularly for use on aircraft (450,261).
6423. DARLOT, A., and CHICK, C.: Devices for the guidance of air and water craft, advertising, and like purposes (450,331).
7125. SALMON, P.: Arrangements for launching aircraft (450,265).
14116. HANDLEY PAGE, LTD., LACHMANN, G. V., VOLKERT, G. R., and DARE, W. J.: Aircraft control gear (450,276).